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Creativity

A Multidisciplinary Systematic Literature Review

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ABSTRACT

Creativity is the first stage of innovation and the essence of the cultural industries. Through a systematic literature review, this study aims to bring together several different understandings and conceptualizations of the creativity phenomenon from various disciplines to address two gaps: one in cultural industries studies and one in creativity studies in general. First, although creativity plays a somewhat pivotal role in the cultural industries studies since the turn of the 21st century, it is mostly to make suggestions about how to create environments to better assist the creative workforce, which forms the backbone of the cultural industries. However, cultural industries scholars often neglect the importance of the cognitive mechanisms, differences in individual, and sociocultural factors. Second, creativity studies have traditionally been dominated by works written by psychologists and behavioral scientists. For this reason, many creativity scholars call for more multidisciplinary studies on the phenomenon. This research reveals that creativity is conceptualized as a combination of cognitive abilities and processes, different modes of thinking, personal variables, and various environmental factors. There are various personality traits associated with creative individuals. However, according to the literature, certain individual variables, such as willingness to take risks, openness to new experiences, and intrinsic motivation, appear to play a more critical role in the cultural industries. The research has also revealed that creative individuals are more prone to depression or other types of mental disorders. This research found that even if the individual possesses all the internal conditions necessary for creative insights, their creative potential might never surface if the external stimulating factors are absent. Environmental factors are of vital importance in the ubiquity of creative expressions.

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1   INTRODUCTION

The term "Culture Industry" was first coined by philosopher/sociologists Max Horkheimer and Theodor Adorno in their book Dialectic of Enlightenment published in 1947, Amsterdam. Adorno himself later defined the culture industry as an industry that "fuses the old and familiar into a new quality [and produces products that] are tailored for consumption by masses." (Adorno, 1991: p.98)

Since 1990s, the theory of Culture Industry has been studied and elaborated by a diverse group of researchers and scholars. Sociologist Bernard Miège introduced a collection of his essays in 1989, in which he criticized the conventional approaches to the Culture Industry for focusing on markets and commodities while neglecting the role of technological innovations in artistic practice (cited in Hesmondhalgh, 2008: p.553). Today, the Cultural Industries are described as "industries which have their origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property" (Müller, Rammer, & Trüby, 2008: p.7).

The creative/cultural industries (synonymous in most of the cases) cover activities of content creation (e.g., films, games, books, news, music, and other types of information goods), design (e.g., arts and crafts, fashion, industrial design, graphic design, web design), architecture, advertising, software (for computer and mobile devices), and all types of publishing. Cultural Industries also include non-profit activities by private or public organizations, such as schools, libraries, museums, et cetera. (Nicholas Garnham, 2005; Müller, Rammer, & Trüby, 2008; David Lee, 2013)

Cultural industries play a central role in the economy (Wasko, Murdock, & Sousa, 2011: p.2) as they are one of the primary sources of innovation in societies; they contribute to the overall generation of new products and services while enhancing the "innovative activities of other enterprises and organizations within and outside the cultural industries" (Müller, Rammer, & Trüby, 2008: p.2). Innovation is about change, cultural products and services, and the production and distribution processes of such products have always changed and developed (Storsul & Krumsvik, 2013).

Innovation theory in cultural industries has its roots in the "creative destruction" theory which was introduced by Austrian economist Joseph Schumpeter (1942/2013). He described creative destruction as the "process of industrial mutation that incessantly revolutionizes the economic structure from within, incessantly destroying the old one, incessantly creating a new one" (Schumpeter, 1942/2013: p.82). Schumpeter argued that the fundamental impulse that drove the capitalist system came from new consumers, goods, new methods of production, markets, new forms of industrial organization (Schumpeter, 1942/2013: p.83).

It is important to point out the distinction between the words innovation and invention in cultural industries and creativity literature. The 19th-century philosopher Josiah Royce (1898, cited in Becker, 1995: p.222) defined invention as "an important new idea, or system of ideas, or an important device or system of devices, by means of which such new ideas are expressed." Though, he did acknowledge the fact that anything new is inevitably based on former devices. On the other hand, Storsul and Krumsvik (2013: p.14) defined innovation as the implementation of existing inventions in a novel context within different socio-economic or -cultural settings, and argued that "there is often a long time-span between an invention and an innovation." They illustrated their argument by pointing out that even though "Leonardo da Vinci invented and made drawings of the helicopter in the 1400s, it was not until almost 500 years later that this invention was implemented into a helicopter that actually flew with people inside."

The importance and ramifications of technological innovations have, since the end of the 20th century, been one of the main focuses of cultural industries academics. Sociologist and a prominent Cultural Industries scholar David Hesmondhalgh (2008: p.522) highlighted the fact that technological innovations have always transformed artistic practice and content creation. For instance, Küng, 2013 (p.10) points to the early utilization of computer-generated imagery for content creation as the reason behind Pixar Studios' current success. Cultural industries are usually associated with their content creation activities, and one of the most predominant understandings of innovation in the cultural industries is the creative process that takes place during content creation (Doğruel, 2013: p.6).

Creativity is the first stage of innovation process and it is the essence of the cultural

industries because the production of cultural goods is the sector's fundamental activity and *raison d'être*. Creativity is an integral part of everyday activities in cultural industries since, as Scase (2002) points out, "without their employees coming up with ideas that can be turned into commercial, saleable commodities, [cultural industries] ceases to exist; therefore, the need for ongoing supply of creativity and novelty is constant." (cited in Küng, 2017: p.106)

Creativity from a Western perspective is defined as the ability to produce work that is both novel and appropriate (Sternberg & Lubart, 1995; Lubart, 1999; Smith & Carlsson, 2006; Sawyer, 2006, Feist, 2010; Kim, Cramond, & VanTassel-Baska, 2010). "Novel work is original, not predicted, and distinct from previous work" (Lubart, 1999: p.339), although scholars acknowledge that the word original can be vague since "original thought does not exist in a vacuum" (Csikszentmihalyi, 1999: p.315). Ergo, novelty should be best understood as a re-representation of past knowledge (Gabora, 1996: p.3).

However, novelty alone is not enough since we still need to be able to "distinguish eccentric or schizophrenic thought from creative" (Feist, 2010: p.114). Thus, for an idea or a product to be acknowledged as creative, it also needs to be "useful or appropriate according to [a] particular task or discipline" (Russ & Fiorelli, 2010: p.233). Moreover, both novelty and appropriateness must be defined socioculturally because what is considered original and useful/appropriate in one culture or society might not be in another (Sawyer, 2006: p.121; Kim, Cramond, & VanTassel-Baska, 2010, p.400).

Creativity has, to some extent, been within the scope of cultural industries studies. Müller, Rammer, and Trüby (2008: p.8) highlighted three facets of creativity in connection with the cultural industries studies: creativity of individuals (artistic or aesthetic talent in the creative process), creativity of products (a service or product's degree of uniqueness), and creativity of processes (processes to deliver products and services). However, most of the discussions revolve around technological and organizational innovations in relation to the creativity of products and processes. The authors often turn to economists like Joseph Schumpeter or Clayton M. Christensen to refer to decades-old, overanalyzed theories such as "creative disruption" and "disruptive innovation." On rare occasions when they focus on creative individuals, it is only to make suggestions about how to design more suitable environments to better accommodate what Richard Florida referred to as the

"creative class" (cited in Hesmondhalgh, 2008: p.561).

On the other hand, the problem with the creativity studies in general, the majority of articles on creativity, since the 20th century, were written by psychologists and they tend to "see creativity exclusively as a mental process" (Csikszentmihalyi, 1999: p.313), focusing mostly on the individual variables, ergo, missing out the social structures that shape the thoughts and behaviors of creative individuals in the first place. Scholars of creativity have recognized that "creativity arises through a system of interrelated forces operating at multiple levels, often requiring interdisciplinary investigations" (Hennessey & Amabile, 2010: p.571). Creativity is an extremely complex phenomenon, and it is as much a sociocultural as it is a psychological occurrence; thus, the study of creativity requires the contribution of various disciplines (Csikszentmihalyi, 1999: p.313; Sawyer, 2006: p.113).

This study aims to address these two problems. First, it provides an extensive review of the underlying factors of creativity, such as the cognitive mechanisms and individual variables, which are often neglected in the cultural industries studies, to keep the understandings of creativity in the cultural industries studies up to date. As Hennessey and Amabile (2010: p.569) pointed out, investigators in one field are often unaware of advances in other domains since scholars can only study creativity within the context of their own domain due to the sheer depth and complexity of the phenomenon. Second, since much of the work on creativity has been written by psychologists or behavioral scientists, this review aims to answer the calls for multi-disciplinary studies on creativity on a modest but most ambitious scale by incorporating studies from Philosophy, Psychology, Social Sciences, Humanities, Business and Management disciplines.

This research conducts a multidisciplinary systematic literature review on creativity to find answers to the following questions: (1) What are the biological underpinnings of creativity? (2) What are the cognitive mechanisms at play? (3) What is the creative process? (4) What are the individual variables observed in highly creative people? (5) How do creative ideas originate? (6) What are the environmental factors fostering or inhibiting creativity?

The theoretical section of this work begins with the background on creativity studies to

show how approaches to creativity as well as concepts and theories have evolved over the years. Second, I move on to the most microscopic understandings of creativity, presenting the findings of creativity studies in relation to neurology, genetics, and intelligence. Third, I broaden the lens to highlight studies focusing on cognitive mechanisms that influence and drive the creative process. Fourth, individual variables that are observed in highly creative individuals are identified and analyzed. Fifth, I give general considerations about biological evolution and highlight its relevance in creativity studies. Sixth, I overview a wide spectrum of sociocultural approaches to creativity by first tracing back the origins of creativity, highlighting critical periods in the evolution of hominin cognition and creativity, followed by cultural evolution theories, which offer an unconventional approach to the phenomenon of creativity. I end by taking a closer look at the role and significance of various social environments, cultures, and societies in understanding creativity and then identifying factors that may hinder or facilitate creativity.

2   METHODOLOGY

The methodological framework of this study is a systematic literature review. The steps followed in structuring this review are based on a synthesis of several of the most cited academic works on writing an effective systematic literature review in Social Sciences on ResearchGate.com.

A literature review refines existing literature in a domain so as to provide an overview of the status quo in that domain and helps to build an understanding of the theoretical concepts and terminology found in the corresponding literature. Uncovering gaps in the existing literature, identifying research methods and strategies embraced by other academics in the field, acknowledging salient authors and their theories, and highlighting potential conflicts in the literature are some of the main reasons to conduct a literature review. (Rowley & Slack, 2004)

A literature review can be both an outcome and a method of a study. "The outcome perspective refers to different kinds of literature reviews that serve different purposes, while the method perspective refers to the ways in which one actually reviews the literature" (Vom Brocke et al., 2015: p.207). From an outcome perspective, a literature review may provide frame and background information for a research, review a domain

as a standalone paper, or provide the review section for a research thesis (Vom Brocke et al., 2015: p.207). This work is a standalone review regarding its outcome. This type of literature review is more extended than background reviews or even empirical papers and is concerned with classifying and categorizing existing research, identifying concepts and theories, pointing out overanalyzed research areas, and identifying areas for future research (Okoli & Schabram, 2010).

This work adapts the systematic review method. On the one hand, in such reviews, the data collection and extraction are guided by specific research questions and can be very effective in pinpointing the relevant information; on the other hand, systematic literature reviews have been criticized for being "mechanistic and too focused on identifying literature at the expense of scholarship in performing the actual review" (Vom Brocke et al., 2015: p.208). Therefore, to mitigate this shortcoming, although relevant research questions had been employed at the beginning of the literature searching phase, they continually developed throughout the reviewing process in order to be more precise in their areas of interest.

There are sequential steps to establishing a well-founded systematic literature review: literature search, selection of literature, synthesizing included literature, structuring the literature review, and finally writing the review. Each of these phases includes a variety of detailed tasks, such as finding, reading, mapping, organizing, and interpreting the findings. In the writing process of this review, the iterative approach was adapted: the method of searching, collecting, analyzing, and synthesizing previous publications simultaneously and continually. (Rowley & Slack, 2004; Okoli & Schabram, 2010; Vom Brocke et al., 2015)

Literature search refers to the process of searching and identifying data in online or offline databases, which can quickly become a tortuous process. Although researchers should stop searching for relevant publications and begin to synthesize selected works at some point, it is not always easy to say whether the acquired data has reached its saturation point. "A literature search usually reaches saturation if it does not produce any new citations that are of potential relevance." (Vom Brocke et al., 2015: p.211)

Advancements in information and communication technologies have made searching for

literature even more complicated. While the Internet has enabled instantaneous access to available publications in any domain, it has led to a mushrooming of studies that need to be considered for review. For instance, a straightforward search for the word "creativity" with Google Scholar generates almost 3 million publications (Google Scholar, 2019). Because our technical capacities to find and retrieve information have outgrown our ability to read, evaluate, and synthesize the resulting body of work, the challenge of performing a literature review has shifted from being able to collect sufficient data to condensing all the available data. (Vom Brocke et al., 2015: p.206)

The reviewing process for this work began with a literature search based on the keywords that were available to me at the start of this work. According to some scholars, because infinite terms can be used to describe analogous concepts, keywords can sometimes be limiting. Also, until a critical understanding of a subject area is achieved, locking in on the keywords will be misleading. Ergo, keywords are continually refined as the researcher gains a deeper understanding of the essential themes, concepts, and theories while reading the field's seminal papers. (Rowley & Slack, 2004)

In order to minimize the risk of acquiring studies that are not in the scope of this work as well as to determine the salient works on creativity, one other method used for searching data is the "backward and forward" method. "Backward searching refers to collecting appropriate publications by screening the reference lists of the papers retrieved from the keyword search (going backward in time), while forward searching refers to collecting appropriate publications that have cited these papers (going forward in time)." The backward and forward searching is useful in identifying publications that were not available with the initial keyword search; it also increases the reliability of the literature search findings as researchers can compare their search results with the bibliographies of the seminal papers. This type of inclusion and exclusion procedure followed during the publication selection for this review provides a significant bibliography that may be an invaluable source of reference to other works in the area. (Vom Brocke et al., 2015: p.214-217)

Data collection for this study was performed using a combination of digital and printed copies of books and articles found in databases and libraries of Helsinki, Aalto, and Arcada Universities. The online databases used to download literature for this review

have two levels of search options: Basic and Advanced. With the basic search option, very precise terms or keywords can be searched (e.g., creativity, innovation, cultural/creative industries). Basic searches prioritize and recommend documents in which the inputted keywords appear close to one another. After the first investigative searches and as a more comprehensive understanding of the role of creativity theories in cultural/creative industries had been established, the basic search option seemed not to offer a very focused list of references.

The advanced search option, on the other hand, offers a range of search parameters to assist in the formulation of more precise searching results. Such search options principally allow users to input more specific combination of words in the search statement by using the Boolean operators; NOT, AND, and OR (Rowley & Slack, 2004). This option additionally allows the specification of the location of the search terms in a document. Defining pertinent search parameters has a significant impact on the relevance of the search results, and "while the exact use and interpretation of search phrases can be determined with the help of brackets, the precision of the search can be influenced with quotation marks, for exact phrase searching" (Vom Brocke et al., 2015: p.215). For instance, it became possible to locate and distinguish publications that have "disruptive technologies" in their abstracts while having both Media and Innovation words in their titles.

The first of the publications to be reviewed in this work were selected from The Handbook of Political Economy of Communications (2011), The Sage Handbook of Cultural Analysis (2008), and three Cambridge Handbooks of Creativity published during the last three decades (1999, 2010, and 2019). The rest of the works were then selected using the backward- and forward-searching method. There is a total of n=56 articles included in this review. N=33 empirical, n=23 non-empirical, n=47 qualitative, and n=9 quantitative. No specific time frame was set for this review.

As the corresponding literature accumulated, they began to be organized in topical order – both in Microsoft Word and in hard copies. The structuring of this work was undertaken with the categorization and organization of the main themes and concepts. I then created a logical concept map since it is often recognized as an essential prerequisite for establishing an effective review structure – a concept map is the visual representation of

the concepts in a study domain and the relationships between them (Rowley & Slack, 2004: p.37). Since the association of concepts and theories is made based on the researcher's understanding of those at one point in time, the concept mapping procedure for this work had been an ever-evolving process as required by the iterative method.

Although the aim of a systematic review has traditionally been to exhaustively identify, evaluate, and synthesize all the relevant publications on a given subject (Rowley & Slack, 2004; Okoli & Schabram, 2010; Vom Brocke et al., 2015), the ever-increasing number of books, journals, and academic publications – combined with the ubiquity of online databases – often hinders researchers from including most of the available publications in their literature review. Therefore, "calls for comprehensive literature reviews cannot be answered in many of today's reviews," for much of the associated work ends up being omitted from the review (Vom Brocke et al., 2015: p.210).

3   CREATIVITY

3.1   Background

Conceptualizations of creativity grew out of discussions aimed at understanding the true characteristics of human nature when liberated from institutional authority. Throughout the Enlightenment, the philosophical questioning of religious doctrines taught by the church and social resistance against long-dictated dogmas that constructed the social world dictated by monarchs spread across western cultures in parallel to science's own opposition to the authority of such institutions. When the dust settled, the most important takeaway was that freedom of expression and opinion, the right to access information, the right to live, and personal liberties are essential to being an individual. (Becker, 1995; Cox & Schechter, 2003; Mill, 2004; Browning & Kilmister, 2006; Kozbelt, Beghetto, & Runco, 2010; Runco & Albert, 2010; Wasko, Murdock, & Sousa, 2011; Hardy, 2014)

Eighteenth-century European poets, writers, and philosophers were primarily concerned with limits to personal freedoms and the social and political ramifications of such liberties. For instance, Addison (1711) suggested that arbitrary rules or regulations imposed down by society and authority constitutes a detrimental barrier to people's freedoms and originality, hence undermining the development of talent and genius. By

the end of the 18th century, it was so accepted that people do not need artificial social constraints, and neither genius nor talent could be preserved in repressive societies. According to Duff, one of the most prolific and influential 18th-century writers on genius and talent, when freedom is encouraged, spontaneity and genius would come naturally, precisely because they reflect an "innate predisposition." (cited in Runco & Albert, 2010: p.8-9)

During the same century, it was concluded that although a good portion of the population may have some sort of talent that may be responsive to education, genius is exceptionally original. Kant, who is often credited with laying the foundations for the study of aesthetics (Becker, 1995: p.228), defined genius as "limited to that which is original and cannot be duplicated by following a set of rules." Kant believed that genius is manifested in someone and seems to appear from nowhere; it needs no formal education and is exempt from the rules and obligations that apply to the talented (Runco & Albert, 2010: p.8).

Although the very idea of creativity was implicitly present in many of the debates surrounding the meaning of the interconnected concepts like genius, talent, imagination, freedoms, and individuality in the 18th century, conceptual approaches did not take off until a few of the leading philosophers of the Enlightenment period moved beyond these concepts (Runco & Albert, 2010: p.6). Conceptual work, which started the modern investigations into creativity, was born in the 19th century.

Many scholars took a shot at defining creativity during the 19th century; however, many blurred the lines between intellectual genius and creative genius. For instance, Bethune (1837) did not limit the term genius to high intelligence. He suggested that the origins of the word genius came from creating through his or her ability to originate "new combinations of thought, and of presenting them with great clearness and force." On the other hand, Jevons (1877) believed there was enough reason to think that genius is "unconscious and unable to account for its own peculiar powers." According to Jevons, no subject was less amenable to scientific analysis, and a definition was not feasible. He made an attempt to define genius nevertheless: "divergence from the ordinary grooves of thought and action." (cited in Becker, 1995: p.219-221)

After her review of the 19th-century creativity research, Becker (1995: p.219) stated that

the 19th-century authors concentrated on "five basic questions: (a) How is creativity defined? (b) Who has creativity? (c) What are the characteristics of creative people? (d) Who should benefit from creativity? and (e) Can creativity be increased through conscious effort?" Earlier works reflected generalist, often philosophical perspectives. The authors and their works bore only slight resemblances to present-day researchers and research articles because they drew questionable conclusions based only on personal observations with little or no empirical data (Kozbelt, Beghetto, & Runco, 2010; Long, 2014; Runco & Albert, 2010). For instance, as Becker (1995: p.220) explained, George Washington Bethune, a prominent 19th-century scholar on genius and creativity, was dissimilar to the contemporary creativity researchers. "He was a clergyman, poet, musician, and orator." He explained his own definition of genius, pointed out problems concerning the notion, discussed how it could be nurtured and increased, and then drew conclusions on the importance of the role of democracy in creativity.

In spite of the differences in the characteristics of the authors and their discipline, the themes of the 20th century were in essence identical to the themes of the 19th century (Runco & Albert, 2010). In the 20th century, however, approaches to creativity showed a wide spectrum of diversity in character; scientists were convinced that to truly understand the phenomenon of creativity, they needed the cooperation of many disciplines, fields, empirical methods, and research orientations and that this requirement stems from the richness of the subject (Wehner, Csikszentmihalyi, and Magyari-Beck, 1991; Mayer, 1999). For instance, virtually all influential 20th-century psychologists have taken an exploratory view on what creativity meant and how it should be identified and measured based on quantitative data (Runco & Albert, 2010). For this very reason, Becker (1995: p.227) argues, some of the works produced during that time were devoid of the philosophical wisdom which provides depth and richness that existed in the works of scholars of previous centuries.

Today creativity research has been booming. According to Runco & Albert (2010: p.5), "the maturing of a professional interest" in the phenomenon of creativity can be seen in the growth of creativity journals and in the increasing attention creativity gets in the media. Long (2014) examined research methodologies and methods of 1,127 creativity studies published in five major creativity journals between 2003 and 2012. She found out that almost half of the studies (n= 612) were empirical studies on creativity. While 83%

(n= 510) of these empirical studies employed a quantitative approach, only 13% (n= 80) qualitative and 5% (n= 22) mixed methods could be identified. The largest share of qualitative studies came from case studies, 45% (n= 36), which was followed by basic methodology, 26% (n = 21), while the number of grounded theory studies was effectively small, 9% (n= 7).

Long's review (2014) provides a shred of empirical evidence supporting the accusations that 21st-century creativity research is still dominated by quantitative methodology. According to Long, such one-sided dominance undoubtedly shallows the understandings of creativity, especially when we now know that such a phenomenon needs to be studied from many angles. She argued, for example, while quantitative methodologies may fall short of identifying social, cultural, and personal factors of creativity, qualitative and mixed methodologies may offer fresh answers; ergo, there is an urgent need for methodological diversity and rigor in modern creativity research.

However, it is not all doom and gloom, as Long asserted that her findings indicate that creativity researchers have been keeping pace with the recent developments of research methodologies in social sciences as meta-analysis and grounded theory were beginning to take hold in the understanding creativity, however small the percentage of the publications compared to the overall statistics may be. Although her review provides a penetrating insight to research methodologies of the early 21st century, she admits that her review had some shortcomings (Long, 2014: p.428). First, the work focused on dissertation abstracts for the most part. Second, although "dissertations were a good source of empirical data," the review ironically was not strongly supported by any other means of data.

Many attempted to categorize the abundance of creativity theories, for there have been no shortage of theories aiming at conceptualizing the notion of creativity (e.g., Wehner, Csikszentmihalyi, and Magyari-Beck, 1991; Mayer, 1999). The most conspicuous categories found in the literature are: Experimental, Cognitive, Economic, Systems, Evolutionary, and Developmental. For instance, Kozbelt, Beghetto, and Runco (2010: p.20-22) proposed to separate the theories into two incorporating categories according to their orientation to identify and emphasize each category's respective benefits and challenges: scientific and metaphorical.

They defined scientifically oriented theories as that which aspire to meet conventional scientific standards by "searching for objective truth, generating empirically falsifiable hypotheses, and developing computational models of a phenomena, along the lines of the [natural] sciences." In contrast, more metaphorically oriented theories aim at providing alternative representations based on hypothetical thinking and at provoking novel ideas by breaking free from overly restrictive beliefs about the phenomenon. However, they do acknowledge that not all creativity theories fall into one of these two categories. They also admit that neither of these approaches are mutually exclusive nor endpoints on a unidimensional continuum – for example, metaphorically oriented theories often include rigorous empirical studies and scientifically oriented theories are known to get help from metaphors to illustrate prominent principles in a given phenomenon (e.g., perceiving the mind as an information processor).

Given more scientifically oriented theories' potential to drift into stark empirical conceptualizations, almost in the form of analytical journalism, more metaphorically oriented theories offer a moderating counterbalance by taking into consideration the explanations that are not yet comprehended, argued Kozbelt, Beghetto, and Runco (2010: p.22). They quoted T. H. Huxley on this point: "those who refuse to go beyond fact seldom get as far as fact." They further illustrated their argument by suggesting that had Einstein restricted himself only to the observable, his groundbreaking theoretical work on special relativity would never have been possible.

Definitions of creativity have been criticized for being too broad. Since creative manifestations differ in levels of magnitude, the one-size-fits-it-all approach has been deemed to be not suitable (Hennessey & Amabile, 2010: p.572). In order to remove some of the ambiguity when discussing creativity and creative individuals, Big-C versus the little-c dichotomy was adapted (Runco, 2004; Kaufman & Beghetto, 2009; Russ & Fiorelli, 2010; Ward & Kolomyts, 2010). Big-C creativity is used to refer to objective instances of creativity that have a long and wide impact (Lubart, 2010: p.270) – for instance, a revolutionary theory in economics or an unconventional art movement like Cubism. Such ideas were so monumental that they have earned their creators immortal fame (Simonton, 2010: p.174) – names like John Nash or Pablo Picasso. Little-c creativity, on the other hand, covers more personal, everyday creative expressions that yield no long-term impacts or tangible products. For example, when someone comes up

with a new food recipe that later gets praised by friends and family or a new business model that reduces expenditures by 15% while maintaining productivity and morale. Although solutions such as these may yield memorable instances, any influence they may have is "transient and delimited" (Lubart, 2010: p.270; Simonton, 2010: p.174).

However, Kozbelt, Beghetto, and Runco (2010: p.23) pointed out that this distinction can also be too inclusive or exclusive. To illustrate their point, they ask us to consider two separate instances: a non-eminent artist who makes their living selling their paintings, or teaching an art class at an educational institution, and another person who is very good at painting but only does it as a hobby in their free time. On the one hand, although each of these instances represents some form of creativity, it would be wrong to assume either of these instances could qualify for Big-C creativity, for that refers to genius, a more objective understanding of creativity such as the paintings of Van Gogh or Salvador Dali. On the other hand, if we put both of these instances into the little-c category, we would then be ignoring within category differences.

In an effort to address this limitation, Kaufman and Beghetto (2009) suggested the use of two additional categories; Pro-C and mini-c. The former helps us identify the different groups in Big-C creativity since it acknowledges professionals who have developed the knowledge, skillset, and motivation needed to be a part of a field. Although their creative products or contributions may not reach the revolutionary levels of the works of eminent individuals, the creators that fall into the Pro-C category are still much more trained and knowledgeable compared to those who create as a free-time activity (Ward & Kolomyts, 2010).

The latter, mini-c, which shares similarities with earlier terms like personal creativity and everyday creativity, differentiates the objective and subjective forms inherent in little-c creativity, while acknowledging and cherishing the "novel and personally meaningful interpretation of experiences [and] actions" that describe the instances of little-c creativity (Kaufman & Beghetto, 2009: p.3). Mini-c advocates the idea that those without a proper education in a particular discipline or even children have personal assumptions regarding the rules and boundaries of that domain, and with the appropriate feedback and instructions, they may gradually advance toward the little-c, Pro-C, or even Big-C categories (Ward & Kolomyts, 2010: p.96).

3.2   Biological Underpinnings

3.2.1   Neurology

The neurological studies on creativity kicked off only a few decades ago, thanks to advances in technology, which in turn encouraged neuroscientists to re-ask the age-old questions such as: How does the brain generate creative ideas? Can we find evidence of creative thinking in the brain in the same way we can observe neural underpinnings of memory or emotion? What kind of cognitive processes are involved in idea generation? (Hennessey & Amabile, 2010: p.573)

Over the last two decades, neuroscientists have been studying certain regions of the brain during creative activity, and one prominent finding suggests that the brain's frontal lobes and right hemisphere display the highest neural activity during creative activities (Csikszentmihalyi, 1999; Smith & Carlsson, 2006; Feist, 2010; Hennessey & Amabile, 2010). Concerning cognitive differences between the hemispheres, it has been argued that the right hemisphere is stimulated when dealing with heuristic, novel, or broad (early-stage) information, whereas the left hemisphere is activated when processing analytical or detailed (late-stage) information (Bowden & Jung-Beeman, 2003; Feist, 2010). Such asymmetrical activity observed in the right and left hemispheres is known as laterality (Feist, 2010: p.118).

Bowden and Jung-Beeman (2003: p.735) presented data and suggested that there are clear associations between strong semantic activation – which refers to building mental connections between related concepts – observed in the right hemisphere and the "Aha!" moment when people come up with creative solutions to problems. After using several neurological methods, Kounios et al. (2006, cited in Hennessey & Amabile, 2010: p.574) argued that mental operations preceding idea generation lead to increased activity in medial frontal regions responsible for cognitive control as well as in the right temporal area associated with semantic processing. Moreover, Csikszentmihalyi (1999: p.330) pointed out that many eminent historical figures (e.g., Einstein, Alexander the Great, Picasso, Michelangelo, etc.) were noted to be either ambidextrous or left-handed, an apparent indicator of dominant right hemisphere activity. However, Csikszentmihalyi advised caution when linking such observations to creativity since such trends, he suggests, might have only been deviancy from the norm.

Contrary to the aforementioned consensus, another finding suggests that creative thought originates not from the increased activity within certain regions of the brain, but rather from the dynamic neural cooperation between all major sections (Feist, 2010: p.117; Smith & Carlsson, 2006: p.228). For instance, in a study by Carlsson (1992, cited in Smith & Carlsson, 2006: p.226), it was observed that the hemispheric activity differences in not so creative people were, as expected, significant; however, the brain activities in highly creative people were observed to be bilateral, both hemispheres operating in cooperation and in a similar way. In addition, Martindale (1999: p.148; cited in Feist, 2010: p.119) discovered that creative people appear to exhibit heightened neural activity in the right hemisphere only during the creative thinking process, not all the time. Therefore, suggesting that the right side of the brain is the driving force behind creativity would be a simplification of an extremely complex phenomenon (Feist, 2010: p.118).

There have been several studies focusing on the brain activities of individuals with brain abnormalities or injuries to uncover more information about the neurological foundations of creativity (Feist, 2010; Hennessey & Amabile, 2010). For instance, Mell et al. (2003: p.1708) discovered that losing certain brain faculties due to mental impairments could allow for the emergence of new artistic skills. They reported on a case of a painter who allegedly developed new artistic insights, according to experts in the field, after suffering from dementia. Mell et al. (2003: p.1708) suggested that this phenomenon may have resulted from the removal of certain restrictions in the areas responsible for visual creativity upon suffering from dementia.

In light of these findings, Feist (2010: p.119) asked the most appropriate question: Are such neurological discrepancies observed in the brain the causes or effects of creative insight? He believed that the only way to answer this question would be to "conduct [further] brain studies on those who are highly creative and compare them to baselines of those low in creativity." He then concluded by suggesting that "seeing consistent brain activation differences in the creative compared to the less creative group would support the idea that these regions are causes rather than effects of creative insight."

3.2.2   Genetics

The question of who has creativity divided opinions in the 19th century. Is creativity an

inherited ability or is it something that anyone could have? Galton (1882, cited in Becker, 1995: p.223) believed that genius was to be inherited from one's family and the intellectual evolutionary process could be accelerated by "supplanting inefficient human stock by better strains."

Galton (1882) addressed the possible connections between insanity and genius, and concluded that there was a "painfully close relation between the two," which, according to him, confirmed the idea that genius was to be inherited as in the case of insanity – studies that focus on the relationship between mental illness and creativity are reviewed later in more detail in this work. Jastrow (1898) drew attention to several cases of historically influential people and their families who suffered from mental illnesses, supporting Galton's views on the matter. On the other hand, however, Lombroso (1891) argued that "because of the predominance of sterility and of degeneration" observed among geniuses, there could be no logical grounds behind arguments suggesting any dominant role of heredity in genius. (cited in Becker, 1995: p.223-224)

Towards the end of the 20th century, in light of advances in neuroscience, researchers began to focus on the biological components of creativity and the effects of genetics. According to Feist (2010: p.114; 2019: p.356), we now know that genetic differences contribute to the variations in brain structures, which in turn causes differences in personalities, and specific constellations of personality traits (social, cognitive, or motivational) may lower the threshold for creative thought. For instance, Bouchard and Lykken (1999, cited in Simonton, 2008: p.30) illustrated that approximately 35% of the variance in personality traits associated with scientific productivity can be attributed to genetics.

Confirmatory to Galton's aforementioned views on the matter, genetic explanations of creative personalities were, for a long time, thought to be deterministic, because if there were any genetic roots to thought, behavior, or personality, specific traits associated with creativity would then have to be "deterministic and immutable" just like the genes themselves. However, this view is now perceived as "outdated and misleading," for there is no one predefined path to a behavior – hundreds of genes have to come together to shape one individual trait. (Feist, 2010: p.116)

Simonton (2008: p.32) suggested that there are both genetic and non-genetic factors that affect creativity. Epigenesis (beyond genetics) is one such nongenetic influence, which refers to certain genes getting turned on or off – without any changes to the DNA sequence – due to external factors (Feist, 2010: p.116). For example, environmental factors such as stress, diet, or toxins during pregnancy may have an impact on the intelligence of the developing fetus (Feist, 2010: p.125). Simonton (2008: p.32) studied the genetic contributions to scientific creativity and suggested that personality traits based on genetics and general intelligence can play an important role in scientific talent.

3.2.3   Intelligence

Kim, Cramond, and VanTassel-Baska (2010: p.395) defined intelligence as an "ability to understand complex ideas, to adapt to environments, to learn from experience, and to engage in reasoning to overcome obstacles." Intelligence, they argued, reflects a person's mental capacities. Guilford (1967, cited in Kim, Cramond, & VanTassel-Baska, 2010; Smith & Smith: 2010) developed a highly influential taxonomy of intellectual abilities, called the Structure of Intellect (SOI), in which he argued that creative thinking was part of the overall mental processes, which, in and of itself, is governed by intelligence.

The degree of intelligence can to an extent be measured by different types of cognitive tests, such as the IQ test. In light of their research, Sternberg and Kaufman (2010: p. 470) suggested that because part of creativity is the ability to analytically assess ideas before pursuing them, creativity becomes rarer at lower IQ levels. They further argued that although there only seems to be a correlation between intelligence and creativity up to an IQ of around 120 (just above average), this connection appears to become less deterministic after that threshold. However, many scholars agree that conventional intelligence tests cannot measure all types of intelligence. Kim, Cramond, and VanTassel-Baska (2010: p.395) advised researchers to acknowledge that although IQ may be an acceptable proxy for intelligence, it by no means represents the complete form of intelligence since, they argued, such cognitive tests only measure what is currently measurable, and intelligence is not only multi-dimensional but also exceedingly intricate.

Although there are important parallels between creativity and intelligence, research has shown that "the skills and personality factors required to be a creator are very different

from those typical of highly gifted people," thus it would be wrong to equate these two phenomena. Sternberg (2001) postulated that intelligence rather comes into play when the person builds upon existing structures, while creative individual simply wants to disturb these structures and present entirely new ones. The ideal disposition would then be to "strike a balance between intelligence and creativity in order to achieve both stability and change within a societal context." (Hennessey & Amabile, 2010: p.578)

3.3   Cognitive Mechanisms

Some creativity theories emphasize cognitive mechanisms as the basis for original thought and strive to understand these mental activities that pave the path to innovative solutions or products. While some of these theories highlight cognitive styles such as divergent and convergent modes of thinking, others highlight cognitive processes such as problem solving or problem finding. Some focus on conscious calculations such as planning or strategizing, whereas others focus on mental processes that operate below the threshold of awareness. (Kozbelt, Beghetto, & Runco, 2010: p.31-33)

3.3.1   Creative Process

Ribot (1900) proposed that creativity is composed of three principal elements. The first, intellectual element, referred to the ability to analyze concepts within a given subject into parts and then evaluate. The second, emotional element, referred to the ability to associate and form new combinations intuitively. The final element was in reference to unconscious factors such as inspiration. Plato believed that inspiration was the act of gods and that poets lose themselves during the act of creation. (cited in Becker, 1995: p.222 & 227)

Ribot (1900) was of the opinion that creativity could not be summoned at will; ergo, creators themselves were usually unaware of the underlying cognitive processes. He argued that the creative process consists of a "problem, incubation, and then an appropriate act or result" requiring "combinations, coordination, arrangement, and grouping." (cited in Becker, 1995: p.222)

Throughout the course of academic interest in creativity, several creative process models attempting to break down creativity into stages have been proposed – whether they may be sequential or recursive. One of the most enduring stage theories (Wallas, 1926, cited

in Lubart, 1999: p.341; Kozbelt, Beghetto, & Runco, 2010: p.31) consists of four stages: preparation, incubation, illumination, and verification. The first stage, preparation, begins when the individual starts gathering information about a specific domain and ends with the identification of a problem. This stage is followed by a period of time, incubation, when the person deliberately distances themselves from the problem in question to digest all the acquired information. Ribot (1900, cited in Becker, 1995: p.222) coined the term incubation for the first time to describe the period when the mind is continually solving problems at a subconscious level. If the incubation period is fruitful, only then the third stage, illumination, enters the equation by which potential solutions unexpectedly reveal themselves with sudden inspiration. The final step, verification, is implemented by testing the idea and presenting it to a wider audience for recognition. Although Wallas' model has been deeply influential, more recent models are rather based on the idea of recursion whereby the individual may go back and forth between the stages in various combinations, invalidating the linear structure of Wallas' model (Lubart, 1999; Kozbelt, Beghetto, & Runco, 2010).

Smith (1997, cited in Smith & Carlsson, 2006: p.204) pointed out that principal cognitive theories of creativity present the creative thinking process as a problem-solving mechanism in the form of "computational functionalism." For that reason, he criticized such theories for often neglecting decisive psychological factors during subjective perceptual processing. Smith and Carlsson (2006: p.204) encouraged future creativity scholars to remember that "meaning must precede conscious [cognitive operations] in the process of reality construction."

Cross-cultural studies have shown that the creative process model that is widely accepted in the Western world is not at all universal. An anthropological study of 155 painters in India revealed that a distinct creative process model is followed in the Eastern world. The first step of this model begins with the artist meditating and preparing to symbolically remove themselves from the physical world by burning incense. The artist then begins to pray for inspiration to gain personal insight into the spirit of the object they are working on. The final stage is reminiscent of the Western model, referring to the social verification aspect of creativity. (Lubart, 1999: p.342)

3.3.2 Divergent and Convergent Thinking

The distinction between divergent and convergent thinking styles is one of the most frequently occurring phenomena in creativity studies. In fact, while mapping out the themes of creativity research, Williams, Runco, and Berlow (2016: p.388) discovered that divergent thinking was the fourth most common keyword across over 1,350 peer-reviewed articles that were published between 1990 and 2015.

In her review of 19th-century creativity research, Becker (1995: p.221) noted that creativity scholars at the time discovered that creative people have fluidity in their thoughts and move from one idea to another quickly and flexibly. William James (1880) was one of the first to point out the ideational complexity and he wrote the following:

> Instead of thoughts of concrete things patiently following one another in a beaten track of habitual suggestion, we have the most abrupt cross-cuts and transitions from one idea to another […] the most unheard-of combinations of elements, the subtlest associations of analogy; in a word, we seem suddenly introduced into a seething caldron of ideas […] where partnerships can be joined or loosened in an instant, treadmill routine is unknown, and the unexpected seems the only law. (see Becker, 1995: p.222; Runco & Albert, 2010: p.13)

According to Kozbelt, Beghetto, and Runco (2010: p.32), divergent thinking refers to moving ideas in varied directions and creating unanticipated associations among distant concepts, whereby new and original ideas emerge. Feist (2010: p.123) argued that divergent thinkers associate ideas "in a global and holistic manner rather than in a narrow and analytic way." Mednick (1962, cited in Kozbelt, Beghetto, & Runco, 2010: p.31) suggested that ideas may be chained together for various reasons and in different ways – for instance, in an abstract or literal manner – but the utilization of remote associations between ideas (the farther an idea from its starting point) appears to almost always lead to more original solutions. He further argued that creative individuals intuitively and swiftly move on to more remote associations rather than fixating on the apparent alternatives. They tend to create far more associations for a given concept and they refrain from structuring these associations hierarchically.

According to Feist (2010: p.124), people generally address only the most relevant "sensory experiences" and suppress irrelevant information, which is known as latent inhibition. In contrast, highly creative people are apparently incapable of tuning out seemingly irrelevant information, and as a result, they gain a greater ideational fluency,

which leads to richer idea generation. Creative individuals work on "seemingly disparate topics and projects, consecutively or concurrently, and continually evolve a sense of the relations between them" (Kozbelt, 2019: p.122). However, Gabora (1996: p.919) argued that creating such semantic relationships requires a well-adjusted threshold. In other words, if associations are made too broadly, successive thoughts would not have the necessary meaningful relationship to one another, which would lead to far-fetched, unrealistic idea generation, and the individual could, therefore, fail to accomplish even survival tasks.

Convergent thinking, on the other hand, refers to a thought process that is analytical, logical, and controlled; it focuses on finding one conventional correct answer to standard problems (Plucker & Makel, 2010: p.52). While divergent processes are hypothesized to occur during idea generation, convergent processes are argued to be employed during refinement stage, while testing an idea (Gabora & Kaufman, 2010: p.285).

The capacity to shift between these two modes of thought is referred to as contextual focus since it requires the ability to focus or defocus one's attention in response to changing circumstances. Defocused attention supplements the divergent thought process since it activates broader regions of memory, facilitating more comprehensive semantic activation. In contrast, focused attention complements the convergent thought process by constraining memory activation, allowing logical mental operations to utilize only the most relevant concepts. To illustrate, in a convergent thought process, "the concept giant might only activate the notion of large size, whereas in [a divergent thought process,] the giants of fairytales might come to mind." (Gabora & Kaufman, 2010: p.285-286)

Kozbelt, Beghetto, and Runco (2010: p.32) argued that the best way to enable the emergence of creative insights is to synthesize divergent and convergent thinking modes. Echoing the same argument, Gabora and Kaufman (2010: p.286) stated that when the individual is stuck on a problem, "defocusing attention enables the individual to enter a more divergent mode of thought, and working memory expands to include peripherally related elements of the situation. This continues until a potential solution is glimpsed, at which point attention becomes more focused and thought becomes more convergent, as befits the fine-tuning and manifestation of the creative work." Those who would like to acquire much more detailed insight on the relationship between different modes of

thought and creativity should refer to Runco (2010).

3.3.3   Problem Solving and Finding

According to Mayer (1999: p.454), certain experimental approaches to creativity promote the idea that creativity could be best understood by uncovering the cognitive processes that take place when tackling with problems. Studies focusing on creative problem-solving and -finding advocate that "traditional cognitive psychological concepts like problem representations and heuristic search through problem spaces" have the potential to shed much light on the creative solution process.

Although problem-solving has traditionally been studied in puzzle problems, the same principles also apply to the type of problems that are in the scope of creativity research. Open-ended problems like writing a play or composing a symphony admit multiple "good-enough" solutions, rather than one "correct" answer. According to Simon (1981), highly creative individuals break ill-defined problems into a set of well-defined bits before coming up with solutions; thus, when searching for a solution to a problem, creative people also look for ways to "formulate and represent the problem." (Kozbelt, Beghetto, & Runco, 2010: p.33)

Studies focusing on creative problem-finding are concerned with individuals who would prefer to identify and formulate unrecognized problems rather than attempting to solve already widely acknowledged problems within a given domain (Russ & Fiorelli, 2010: p.236). The problem-finding method finds the problem-solving view inadequate and suggests that realization of an existing problem requires an independent cognitive process (Kozbelt, Beghetto, & Runco, 2010: p.34). Einstein (1938), for example, believed that anyone who is technically equipped could solve an already-formulated problem, but identifying and formulating a new problem, on the other hand, requires true originality (cited in Csikszentmihalyi, 1999: p.331).

In experiment by Runco and Okuda (1988), a group of teenagers were presented with a specific problem and asked to originate their own problems from the information given. They were then expected to provide solutions not only to the given problem, but also the problems they themselves came up with. The results indicated that the teenagers proposed

much more creative solutions to the self-generated problems. However, these results differed from the results of Wakefield's (1985) study with children aged between 9 to 11 years. This discrepancy between the two test results may indicate that creativity both increases and changes qualitatively with age. Through their experiment, Runco and Okuda (1988) demonstrated the importance of both problem-solving and problem-finding skills to tackle real-world problems. (cited in Russ & Fiorelli, 2010: p.236)

Mayer (1999: p.454) identified three sequential characteristics of experimental studies on creative problem-solving and -finding: (1) samples are tested in controlled environments, (2) researchers always apply quantitative measuring tools, and (3) as the final step, researchers analyze the component processes noted during the course of the experiment. On the one hand, experimental approaches provide for internal validity since they are carried out almost always in controlled environments (Mayer, 1999: p.455), and they "reduce the complexity surrounding creativity and thereby allow sound inferences about causality" (Runco & Sakamoto, 1999: p.62). On the other hand, such approaches are criticized for lacking external validity since results fail short to generalize the concept of creative thinking. Moreover, Runco and Sakamoto (1999: p.62) argued that because spontaneity is believed to be one of the underlying characteristics of creativity, controlled environments may be counterproductive to measure creativity correctly.

Both problem-solving and -finding approaches acknowledge that creative achievements that fall in the Big-C category cannot be achieved without a tremendous amount of relevant background knowledge, and this is further discussed in the following subsection.

3.4   Creative Individual

The most thoroughly studied facet of creativity is the variations in individual differences (Sternberg & Lubart, 1995; Csikszentmihalyi, 1999; Sternberg, 2006; Feist, 2010; Hennessey & Amabile, 2010; Kim, Cramond, & VanTassel-Baska, 2010; Runco & Albert, 2010; Sternberg & Kaufman, 2010). Traditionally, empirical studies focusing on the individual level aim at finding answers to questions like to what extent creative people differ from the mean and what kind of personality traits these individuals possess (Becker, 1995: p.224, Hennessey & Amabile, 2010: p.577).

Early research focused on artists, scientists, writers, and people from other domains who were indicative of creative potential (Kozbelt, Beghetto, & Runco, 2010: p.25). This subsection first identifies and then discusses consensuses and disagreements among creativity researchers regarding individual difference variables observed in highly creative individuals.

3.4.1 Intellectual Qualities

Bethune (1837) believed that creative genius depended on several intellectual abilities: the ability to combine ideas, clear judgment, swift perception, perseverance, memory, imagination, and the sense of aesthetics. Almost a century later, psychologist Dabrowski (1938) echoed Bethune when he suggested that the bearer of the creative mind had an active imagination, strong ability to identify, associate, make inferences, and would refrain from making rash decisions. The creative genius, contrary to popular belief, should have a receptive mind. (cited in Becker, 1995: p.220-224)

Jevons (1877) wrote:

> The man of one idea has but a single chance of truth. The fertile discoverer, on the contrary, chooses between many theories. […] He compares time after time, and then chooses […] He must be fertile in theories and hypotheses, and yet full of facts and precise results of experience. He must entertain the feeblest analogies, and the merest guesses at truth. […] When there are any grounds of probability he must hold tenaciously to an old opinion, and yet he must be prepared at any moment to relinquish it when a clearly contradictory fact is encountered. (see Becker, 1995: p.221)

Today, creativity scholars agree with the 19th-century perception that certain intellectual qualities are required for the creative mind, such as the "ability to make connections, ask questions, use imagination, think flexibly, experiment with ideas" (Lubart, 2010: p.270). Sternberg (2006: p.88) argued for three distinct intellectual skills associated with highly creative individuals. First, the analytical skill allows the individual to evaluate their ideas to establish which of them are worth pursuing further and which are not. Csikszentmihalyi (1999: p.332) noted that creative individuals were extremely confident when weeding out bad ideas before having invested time and resources in them. One prerequisite for such ability, however, is to gain extensive domain-specific knowledge, which is addressed in a later section.

Second, the synthetic skill allows the individual to think outside the box and look at

problems in unconventional ways (Sternberg, 2006: p.88); it requires the metacognitive ability (Kozbelt, Beghetto, & Runco, 2010: p.32), which refers to being conscious of thought processes as they take place. The synthetic skill mediates the ability to switch between the divergent and convergent thinking modes, and the decision to divert the thinking style must be made consciously by the individual (Sternberg, 2006: p.89). For instance, tactical thinking methods such as "shift your perspective, think backward, turn the situation upside-down," and others are predominantly employed so as to increase creative problem-solving skills precisely because they refer to conscious actions, and if need be, they can be employed by the individual (Kozbelt, Beghetto, & Runco, 2010: p.32).

Finally, the practical–contextual skill refers to the ability to persuade others of the value of one's ideas, which is further discussed in the next subsection. However, Sternberg (2006: p.89) cautions us not to mistake possessing these skills with being creative, because even if one shows the signs of having one or all of the appropriate skills, they may still not be able to think creatively. He quite adeptly explains the significance of the deliberate intention, which requires no paraphrasing:

> Although levels of these resources are sources of individual differences, often the decision to use a resource is a more important source of individual differences (p.88) [...] To be creative one must first decide to generate new ideas, analyze these ideas, and sell the ideas to others. In other words, a person may have synthetic, analytical, or practical skills but not apply them to problems that potentially involve creativity. For example, one may decide (a) to follow other people's ideas rather than synthesize one's own, (b) not to subject one's ideas to a careful evaluation, or (c) to expect other people to listen to one's ideas and therefore decide not to try to persuade other people of the value of these ideas. The skill is not enough: One first needs to make the decision to use the skill. (see Sternberg, 2006: p.90)

On another point, after giving several study examples, Sternberg also (2006: p.88) argued that creative individuals are observed to devote most of their time and energy on broad planning (early-stage), whereas poorer reasoners tend to spend more time and energy on local planning (late-stage).

3.4.2 Personality Variables

In the 19th century, Lombroso (1891) presented an extensive list of common attributes, behaviors, and even physical characteristics of many historical geniuses. He observed them to usually be "short, pale, left-handed, gray-haired, bald, long-lived, and lean."

According to Lombroso, they were regarded as bad students overall, and tend to "misinterpret the acts of others, believe themselves persecuted, and find everywhere profound and infinite reasons for grief and melancholy." However, it has since been pointed out that his conclusions did not have the necessary factual basis. (cited in Becker, 1995: p.224)

After her highly influential study on intelligence, creativity, and personality, Cox (1926, cited in Runco & Albert, 2010: p.15) concluded that individuals who achieve eminence show not only "high intellectual traits, but also persistence of motive and effort, confidence in their abilities, and great strength or force of character." Although personality and intelligence are both mediators for creative thought and expression, research suggests that certain personality characteristics compared to intelligence are a stronger indicator of lifetime creative achievements (Feist, 2010; Kim, Cramond, & VanTassel-Baska, 2010; Runco & Albert, 2010; Sternberg & Kaufman, 2010). Personality characteristics "mediate the relationship between brain and creative thought and behavior" (Feist, 2019 p.356).

Psychologists today define personality as a set of well-established and unique "behaviors, feelings, thoughts, and motives" that make up an individual (Feist, 2010: p.114). Numerous personality traits have been linked to eminent creative achievements, and creative people observed to be strong on some of these, such as self-reliance or being concerned with their own thoughts and feelings rather than with external things, and weak on others, like conformity and moral certainty (Csikszentmihalyi, 1999: p.331). The most noted characteristics in the literature are: careful and accurate observation, mental discipline (Becker, 1995: p.221), greater sensitivity, naiveté, arrogance, impatience, higher intellectual standards (Csikszentmihalyi, 1999: p.332), attraction to complexity, high energy, independence of judgment, intuition, self-confidence, a firm sense of self as creative (Runco, 2004: p.661), tolerate ambiguity, willingness to overcome obstacles and to take sensible risks, (Sternberg, 2006: p.89), wide interests, autonomy, and openness to experience (Kozbelt, Beghetto, & Runco, 2010: p.25).

After his meta-analytical review of studies published over a 50-year period on creativity and personality, Feist (1998, p.290) concluded that creative people in the arts and the sciences (including the social sciences) share certain traits associated with creativity. He

found that creative people, regardless of the domain they operate in, are perceived as being more open to new experiences, self-confident, self-accepting, impulsive, ambitious, dominant, hostile, driven, but less conventional and, contrary to popular belief, not so conscientious. On the other hand, there are also several unique, domain specific characteristics observed in these individuals. For instance, scientists compared to artists are credited to be more conscientious, whereas artists are found to be more emotionally unstable and affective, less social and less synonymous with conformity. However, as Feist (1998) himself pointed out, the problem with these kinds of conclusions is that there is no way of knowing whether these traits are the cause or effect of creative behavior. In other words, is it these observed personality traits that enable creativity or, conversely, is it creativity itself that leads to such characteristics regardless of the domain (Baer, 2010: p.334)?

Perhaps the most noteworthy characteristic of such individuals is their curiosity, their openness to experience (Csikszentmihalyi, 1999; George & Zhou, 2001; Hennessey & Amabile, 2010), which according to Feist (2010: p.120), plays a fundamental role in creative achievements. He noted that empirical evidence suggests that open people tend to be much more curious and imaginative, and therefore more creative. According to Csikszentmihalyi (1999: p.330), creative people are driven by their curious nature and without it, they would not be able to delve deep into the laws that govern a given domain. Moreover, Hennessey and Amabile (2010: p.577) argued that when creativity is viewed as one individual-difference variable, low levels of latent inhibition – "inability to shut out the constant stream of incoming stimuli" – have been associated with high levels of openness to experience.

However, it is important to note that individuals who meet the description above exhibit creative characteristics for the most part during open-ended tasks and in unstructured environments (Feist, 2010: p.121). Also, Simonton (2008: p.32) argued that openness to experience contributes more to performance than training, and that it could on occasion even have a negative impact as it could distract the individual "from specializing on a very narrow set of domain-specific knowledge and skills." Peterson and Carson (2000) and Peterson, Smith, and Carson (2002) are two other examples of studies that assert a negative relationship between openness to experience and creativity (cited in Hennessey and Amabile, 2010: p.577).

Those who have the intrinsic motivation to leave a mark on this world need to be focused, ambitious, and persistent for they will most likely face "hindrances and roadblocks" along the way (Feist, 2010: p.122). Sternberg and Lubart (1995) posited that thinking and acting in creative ways often means going against the tide because conventional thinkers who are part of the status quo will fiercely oppose novel forms of operations that require them to go beyond their comfort zone. For instance, Norwegian painter Edvard Munch's first exhibition in München closed the same day it was opened because of the unproportionate negative reactions from the critics; many important works of literature and art faced the same fate when they were first introduced (Sternberg, 2006: p.90). This notion leads to the recognition of three more rigorously analyzed characteristics of creative individuals, persuasiveness, self-confidence, and risk-taking (Sternberg & Lubart, 1995; Csikszentmihalyi, 1999; Smith & Carlsson, 2006; Hennessey & Amabile, 2010; Kozbelt, Beghetto, & Runco, 2010, Sternberg & Kaufman, 2010; Küng, 2017).

Csikszentmihalyi (1999: p.314) wrote that if an individual cannot convince others that they have found an innovative solution to a problem, there is no other way of knowing whether they have actually found one, but once the person persuades others that they have something original, they will then inevitably be recognized as creative. According to the investment theory, also known as the economic theory of creativity, proposed by Sternberg and Lubart (1995), the creative person buys low by presenting an idea that is not much valued at first and then sells it high after convincing others of the idea's value and moves on to another idea.

Sternberg (2006: p.88) identified a type of social skill that he called the practical skill variable that enables the individual to effectively persuade others of the value of their ideas. Creative people shape the way others think; thus, they must be persuasive (Sternberg, 2006: p.88), and this, according to Küng (2017: p.176), is an indispensable asset for those who hold decision-making positions in the cultural industries because leaders of the creative sector usually have to involve in "social influence process" which aims to move a group of creative and highly-confident people towards a goal in lines with their visions. However, as pointed out by Kozbelt, Beghetto, and Runco (2010: p.25), it is worth noting that emphasis on this practical skill implies that the instances of little-c creativity are not to be perceived as creative.

There is no real consensus in the literature concerning potential positive correlations between creativity and self-confidence (Smith & Carlsson, 2006; Feist, 2010; Hennessey & Amabile, 2010). A study done by Smith and Carlsson (1990, cited in Smith & Carlsson, 2006: p.225) demonstrated that although the connection between creativity and self-confidence is not easy to recognize in younger children, there seem to be some correlations when it comes to older children and adults. Contrary to the assumption that only higher levels of self-confidence should be associated with highly creative people, Kaufman (2002, cited in Hennessey & Amabile, 2010: p.577) argued that creativity can also manifests itself through lower levels of confidence. After having done a series of studies with young kids, adolescents, and adults, Smith, Carlsson, and colleagues (cited in Smith & Carlsson, 2006: p.225) concluded that high levels of self-confidence are typical for both low- and high-creative people. However, according to Smith and Carlsson (2006: p.225), the crucial distinguishing factor is that only highly creative people can utilize high levels of self-confidence.

As Sternberg and Kaufman (2010: p.469) pointed out, if the individual does not ignore rejections and take risks, their creative potential could forever remain latent. Küng (2017: p.179) suggested that the ability and willingness to take risks is a common personality trait observed among decision-makers in the cultural sector. In her own words: "in the digital media-technology sector, leaders' risk-taking can stem from their personal, perhaps transgressive, vision for how the strategic environments will develop in the long term" (Küng, 2017: p.178).

To sum it up, it is imperative to stress out that when assessing creativity, rather than focusing on a single independent trait, we should study the interactions between all of the above-mentioned characteristics across the entire spectrum, because:

> [Creative people] are not just introverted, but can be both extroverted and introverted, depending on the phase of the process they happen to be involved in at the moment. When gathering ideas, a creative scientist is gregarious and sociable; when starting to work, he or she might become a secluded hermit for weeks on end. Creative individuals are sensitive and aloof, dominant and humble, masculine and feminine, as the occasion demands (Csikszentmihalyi, 1996). What dictates their behavior is not a rigid inner structure, but the demands of the interaction between them and the domain in which they are working. (see Csikszentmihalyi, 1999: p.331)

3.4.3   Psychopathology

In the 19th century, discussions revolving around the personality variables in creative

individuals at times tried to answer the question of how eminent historical figures pathologically differed from the mean (Becker, 1995: p.224). Studies aiming at uncovering potential systematic associations between psychopathology, the study of mental disorders, and creativity has a long tradition (Csikszentmihalyi, 1999; Hennessey & Amabile, 2010; Runco & Albert, 2010; Silvia and Kaufman, 2010).

Ribot (1900, cited in Becker, 1995: p.225) argued that eminent creators were known to be obsessed with their work and he contended that this very characteristic of geniuses was responsible for the pathological approaches to creativity. Runco and Albert (2010: p.15) suggested that Romanticism, Modernism, and Postmodernism supported the stereotypical "associations between creativity and psychopathology" – romanticism is a movement in arts and literature that emerged around late 18th century, emphasizing inspiration, subjectivity, and the primacy of the individual. They quoted Sass (2000) on this point:

> Whereas romanticism views creative inspiration as a highly emotional, Dionysian, or primitive state, modernism and postmodernism emphasize processes involving hyper-self-consciousness and alienation. Although manic-depressive or cyclothymic tendencies seem especially suited to creativity of the romantic sort, schizoid, schizotypal, schizophreniform, and schizophrenic tendencies have more in common with the (in many respects, antiromantic) sensibilities of modernism and postmodernism. [Sass] defined modernism as the formally innovative, often avant-gardist, art and literature of approximately the first half of the 20th century and postmodernism as the cultural and artistic developments largely occurring after World War II. (see Runco & Albert, 2010: p.15)

Becker (1995: p.224) argued that intellectuals or artists during the Romantic period manifested idiosyncratic behaviors in an effort to differentiate themselves from the rest. She quoted Coser (1978) to further illustrate her point: "many a Romantic genius may have assisted in a labeling process in which others took him more seriously than he perhaps wished, and assigned him to the status of a madman."

According to Runco and Albert (2010: p.11), such rationalizations are not only theoretical but can also be observed in the peculiar and unhealthy lifestyle choices of critically acclaimed creative individuals. For instance, Silvia and Kaufman (2010: p.387) pointed out that distinguished writers show higher-than-usual tendencies towards depression or other types of mental disorders (e.g., observe the life of author Charles Bukowski). In another study, Carlsson, Wendt, and Risberg (2000, cited in Smith & Carlsson, 2006: p.227) demonstrated that creative people have higher levels of negative thoughts, anxiety, and perform considerably worse in logical ability and perceptual speed tests.

On the other hand, others have argued against the connections between mental illnesses and creativity. For instance, Bethune (1837, cited in Becker, 1995: p.224) firmly opposed the idea that creative people necessarily had to be eccentric or rude; he believed that "a man of Genius may [also] be a gentleman." In addition, in several of Guilford's studies with highly creative individuals, high divergent thinking scores were associated with it low anxiety levels (Runco, 2010: p.434). Moreover, in a study by Chávez-Eakle, del Carmen, and Cruz-Fuentes (2006, cited in Hennessey & Amabile, 2010: p.578), highly creative individuals scored lower than the controlled group on psychopathology, and the authors then argued that mental illnesses are not so much related to creativity, but instead to personality.

Nonetheless, despite some contradictory voices, the tremendous growth in research focusing on mental well-being and creative thought and behavior over the past 30 years has contributed to the credibility of those who have been advocating such a connection. A growing number of studies (e.g., Martindale & Dailey, 1996; Prentky, 2001; Weinstein & Graves, 2002; Nettle, 2006; Abraham & Windmann, 2008) examine ever so closely the potential associations between creativity and schizotypal personality disorder (cited in Feist, 2010; Hennessey & Amabile, 2010; Runco & Albert, 2010). Schizotypy is a theoretical concept in psychology that concerns itself with a particular personality disorder associated with cases of extreme states of mind related to psychosis such as schizophrenia (Wikipedia, 2020). Feist (2010; p.124) described people suffering from schizotypy as asocial, isolated, and wrote that some of these people believe that the stories they read or watch in the media are directly about them, and they are subjected to continuous scrutiny from the members of society.

Several studies (e.g., Prentky, 2001; Martindale, 2007; Weinstein & Graves, 2002, cited in Feist, 2010; Hennessey & Amabile, 2010) found that certain cognitive styles associated with creativity share a common biological ancestry with cognitive styles associated with schizotypal personality disorder. Both creative individuals and people with schizotypal personality disorder connect ideas in a global and holistic rather than analytic manner as a result of loose semantic information processing in the right hemisphere of the brain.

It is important to note that research since the turn of the 20th century "rather convincingly [demonstrated that] the rate of various pathologies such as suicide, alcoholism, [and] drug

addiction" is much higher in the arts than in the sciences (Csikszentmihalyi, 1999: p.331), for example, "poets or visual artists, compared to scientists, exhibit higher schizotypy scores" (Feist, 2010: p.124). However, Csikszentmihalyi (1999: p.331) believed that such results might be related to the fact that the arts usually offer financially depressing career options as they receive the least economic support.

3.4.4 Motivation

Feist (2010: p.122) re-inquired the long-standing question of – as it was addressed earlier in this work – why do people want to create, and according to him, psychoanalysts have suggested that what lies behind the need to create is "the unconscious fear of death and the desire to overcome our necessarily limited time on this earth." This "awareness of mortality" in the individual mediates the need to participate in creative activities such as music, literature, painting, cinema, or science in order to leave a legacy that would continue to have an impact after death.

Francis Galton (1883) probably was one of the first to address the connection between motivation and creativity as he observed that "leaders of scientific thought were generally gifted with remarkable energy [and] these gifted people had a nature that was urged by an inherent stimulus […] to eminence," and Lombroso (1891) seemed to have echoed Galton when he suggested that the individuals in question "were driven to create by obedience to an all-powerful instinct"– later to be referred to as intrinsic motivation (cited in Becker, 1995: p.224; Runco & Albert, 2010). Sternberg (2006: p.89) argued that motivation is not an innate ability in the individual and that the person needs to make a conscious decision to be motivated by something related to their subjective orientation. Depending on the domain, the desire to learn, express oneself, gain recognition, or succeed in any other sense could all be reasons behind a motivation – e.g., while the motivational factor for scientists may be the desire to learn, for artists it may be the desire to express themselves (Feist, 2010: p.122).

Research on the personality variables in creative people frequently introduces intrinsic motivation as a core component (Runco, 2004: p.661). Intrinsic motivation refers to an individual being motivated to tackle a task solely for its own sake because they find the work in itself exciting, and for them, the most rewarding thing is achieving excellence in

what they are most passionate about (Runco & Sakamoto, 1999; Mayer, 1999; Runco, 2004; Sternberg, 2006; Feist, 2010; Hennessey, 2010; Kozbelt, Beghetto, & Runco, 2010; Sternberg & Kaufman, 2010; Runco & Albert, 2010; Russ & Fiorelli, 2010; Küng, 2017). In general, people seem to exhibit creative characteristics when they are working on areas they love and when they focus on the work itself rather than any potential external rewards (Hennessey, 2010; Hennessey & Amabile, 2010; Russ & Fiorelli, 2010; Küng, 2017).

There have been numerous experimental studies that focused on the importance of high intrinsic motivation in creative work, and one such study (Dewett, 2007, cited in Hennessey & Amabile, 2010: p.581) assessed employee motivation, willingness to take risks, and creativity. Dewett surveyed 165 employees and their supervisors working in research and development department in a large U.S. organization, and the results suggested strong associations between creativity and one's intrinsic interest in the work they do and the willingness to take risks mediated the effects of intrinsic motivation. As several cultural industries academics remind us, even though the cultural industries are usually associated with high-stress environments, long working hours, and relatively lower wages, motivational intakes are so gratifying that artists and creative workers will tolerate such poor conditions (Hesmondhalgh, 2007: p.207; Miège, 2011: p.87; Küng, 2017: p.113). Therefore, it would be safe to suggest that intrinsic motivation has an additional significance for the cultural, creative industries.

Several empirical studies aimed at determining how we should teach creative thinking to improve people's problem-solving performances (Mayer, 1999: p.455). A review conducted by Collins and Amabile (1999: p.300-303) showed that intrinsic motivations foster creative problem-solving ability, and people produce less creative products when they are expected to be evaluated. For example, Hennessey (1989, cited in Runco & Sakamoto, 1999: p.75) studied the effects of extrinsic elements on the creativity of children aged 7-13 years as they worked on computers. He found out that any evaluation method (positive or negative feedback) irrespective of the source (communicated through the examiner or the computer) inhibited the creative expressions of the children on that medium – younger children appeared to be more sensitive to these elements. Therefore, research suggests that numerous conditions such as "deadlines, [financial] rewards, a nagging parent in the case of children" (Küng, 2017: p.113), "coaction, surveillance, [or] evaluation can undermine the intrinsic motivation that contributes to creative efforts"

(Runco & Sakamoto, 1999: p.76).

In another experiment, done by Amabile, Hennessey, and Grossman (1986, cited in Collins & Amabile, 1999: p.394), two separate groups of children were instructed to tell a story, and prior to telling the story the children in one group were given a Polaroid camera to play with, whereas the children in the other group were allowed to play with the camera only after telling the story. While the aforementioned undermining effect of external reward was noted for the latter group; the non-contingent external reward, being able to play with the camera before tackling the required task, enhanced the involvement of the children in former group in the task at hand.

On the other hand, however, there have also been studies suggesting that intrinsic motivation does not always a facilitate creative thought, just as extrinsic motivation does not necessarily have to hurt it (Collins & Amabile, 1999: p.393; Feist, 2010: p.123). Hennessey and Amabile (2010: p.581) explained that under certain specific conditions, the expectation of reward might at times increase extrinsic motivation levels without having any negative impact on intrinsic motivation and creative performances. In a study done by Eisenberger and Rhoades (2001, cited in Feist, 2010: p.123), when participants were explicitly told that the only condition they would be rewarded was to produce an innovative product, the reward appeared to have increased, rather than decrease, the creative performances.

However, Hennessey and Amabile (2010: p.582) criticized this study for equating creativity with only novelty and implied that instructing participants in prior "with details on the kinds of responses that would receive high creativity ratings" undermined their findings. To further illustrate their argument, Hennessey and Amabile (2010: p.582) presented a study done by O'Hara and Sternberg (2001) which argues that the studies championing for the positive effects of extrinsic motivations such as financial rewards "demonstrate positive effects of instructions, rather than positive effects of expected rewards, on creativity." Moreover, Hennessey and Amabile (2010: p.581) pointed out that people who can be encouraged with extrinsic motivations are likely to already have high levels of intrinsic motivation.

To finalize, as Cox (1920;1926, cited in Csikszentmihalyi, 1999; Hennessey, 2010)

argued, if we were to bet on the success of either an intelligent but unmotivated person or a less intelligent but motivated individual, we should immediately choose the latter. This type of reasoning has utmost importance for creative work because the strong intrinsic motivation to be creative first and foremost empowers the individual to overcome existing cognitive constraints (Sternberg & Kaufman, 2010) and enables cognitive flexibility that allows the individual to take risks, experiment and explore new possibilities (Küng, 2017: p.113).

3.4.5 Expertise

Based on the literature, we could conceptualize creativity as a combination of cognitive processes and abilities, personality characteristics, and social factors (which will be discussed later in detail). According to Russ and Fiorelli (2010: p.236), while some of these factors are domain general (e.g., ability to switch between different modes of thinking), others are domain specific (e.g., talent in music). The discussions surrounding domain-specific expertise and knowledge, which are considered to be "necessary conditions for significant creative achievements" (Kozbelt, Beghetto, & Runco, 2010: p.33), play a pivotal role in experimental studies focusing on the creative individual.

In the second quarter of the 19th century, Bethune (1837) had already stressed the importance of "building on the knowledge of the past [and] storing away ideas [in order to allow] for future [cognitive] combinations [and] chain of associations" within a given topic (cited in Becker, 1995: p.221). New becomes meaningful only in relation to old. A piece of information cannot come into existence in a vacuum; it requires a reference to an already existing pattern of notations, symbols, and rules, and without patterns, there cannot be exceptions (Gabora, 1996: p.3; Csikszentmihalyi, 1999: p.314).

In his systems theory, Csikszentmihalyi (1999: p.314) explained that the individual operates in two separate but interconnected environments, namely the domain and the field. He argued that we need to make a clear-cut distinction between these two words in creativity studies. Today, creativity scholars describe the domain as all accepted knowledge and conventions in any one discipline at any one point in time and the field as the social aspect of the domain, composed of experts and peers who decide which proposed ideas are worth preserving for future generations (Sawyer, 2006: p.125). When

proposed solutions to problems fulfill both of these environments' requirements, they are then deemed creative.

Before one could introduce a novelty into a domain, they will first have to grasp all the rules and prevailed practices in that domain – for example, "A composer won't create a brilliant symphony without first absorbing a huge amount of information about prior styles and genres; […] about the different capabilities and weaknesses of different instruments" (Sawyer, 2006: p.125). Jacob Rabinow – who has over 200 patents on a variety of very different inventions, and also worked for the United States Patent Office, meaning that he is one of the people who decide which inventions deserve recognition – argued that in order for one to be considered an original thinker,

> First, you have to have a tremendous amount of information - a big database if you like to be fancy. If you're a musician, you should know a lot about music, that is, you've heard music, you remember music, you could repeat a song if you have to. In other words, if you were born on a desert island and never heard music, you're not likely to be a Beethoven.
> […]
> you get better and better by doing the things you do well, and eventually you become either a great tennis player or a good inventor or whatever, because you tend to do those things which you do well and the more you do, the easier it gets, and the easier it gets, the better you do it, and eventually you become very one-sided but you're very good at it and you're lousy at everything else because you don't do it well. This is what engineers call positive feedback.
> […]
> you must have the ability to get rid of the trash which you think of. You cannot think only of good ideas, or write only beautiful music. You must think of a lot of music, a lot of ideas, a lot of poetry, a lot of whatever. And if you're good, you must be able to throw out the junk immediately without even saying it. ln other words, you get many ideas appealing and you discard them because you're well trained and you say, "that's junk." And then you see the good one, you say, "Oops, this sounds interesting. Let me pursue that a little further." (cited in Csikszentmihalyi, 1999: p.332-333)

Expert knowledge contributes to creative performances regardless of domain because experts remember relevant patterns better, are more adept at generating stimulating questions, and are known to engage in "efficient forward reasoning rather than laborious backward reasoning" when solving problems (Kozbelt, Beghetto, & Runco, 2010: p.33) – while forward reasoning refers to drawing conclusions from data, backward reasoning refers to searching for relevant data to support an assumption within a particular topic. Kozbelt, Beghetto, and Runco (2010: p.33) believe that such forward-reasoning stimulates creative performances to a greater extent in more open-ended tasks, the type of tasks encountered in the cultural industries.

Expertise based theories usually focus on Big-C creativity and it has been argued that

eminent works tend to emerge through the application of a domain-specific expert knowledge acquired over a decade of comprehensive and rigorous study. For instance, in an archival study of 76 distinguished composers, Hayed (1989, cited in Kozbelt, Beghetto, & Runco, 2010: p.33) found out that 73 of the instances had acquired at least ten years of music education before creating their first eminent work – this would later be referred to as the "ten-year rule." On the one hand, one cannot go beyond what is known and lead a domain further without first learning what is already known in that domain (Sternberg, 2006; Sternberg & Kaufman, 2010), and for that reason, newcomers to a field who lack the existing knowledge in that domain are unlikely to be able to come up with imaginative, creative solutions (Küng, 2017: p.112).

On the other hand, it is of vital importance to point out that knowledge also could hinder creativity as it may eventually lead to entrenched and rigid assumptions that could gradually hamper the ability and willingness to approach a particular topic from different perspectives (Sternberg, 2006; Kim, Cramond, & VanTassel-Baska, 2010; Sternberg & Kaufman, 2010). Economic theories of creativity "predict that individuals with high levels of expertise will be less flexible about alternatives, […] than individuals who have invested less into their careers or into a particular theory or method" (Kozbelt, Beghetto, & Runco, 2010: p.30). This is noteworthy for Cultural Industries because the more significant role of the information-based economy in the modern world has led to ever-faster knowledge generation, and almost all cultural products are characterized by a very short life-cycle (Doğruel, 2013: p.7). According to Sternberg and Kaufman (2010: p.474), this has created a paradox: the more important a piece of information is, the faster it becomes obsolete.

In a study comparing expert and novice bridge players (a card game), Frensch and Sternberg (1989, cited in Sternberg, 2006: p.89) observed that experienced players, to nobody's surprise, triumphed over novice players under long-established rules. However, when radical, "deep-structural" changes were introduced in the structure of the game, the expert players suffered more significantly in their game than the novice players, even though they recovered over time. They argued that the reason for this may be affiliated with the fact that experts make deeper use of existing structures, and for this very reason it takes significantly longer to adjust their existing way of thinking in light of shifting circumstances.

Therefore, expertise views acknowledge that the power of knowledge on creative expressions is sometimes exaggerated at the expense of talent. Kozbelt, Beghetto, and Runco (2010: p.34) believe that it is a necessary but insufficient condition for Big-C creativity. Just because one has acquired an extensive background-information about a particular domain, it does not necessarily mean that they would ever create a revolutionary work in that domain.

When we consider creativity at the individual level, it is hard to pinpoint the exact determinants of the individual differences in cognition and personality variables, because while some of these are tied to genetic factors, others could be acquired through conscious effort in the service of self-development (Csikszentmihalyi, 1999: p.332). In any case, although, as Baer (2010: p.334) noted, one should not necessarily infer causations from observed correlations, individuals who possess the prerequisites stated in this subsection are considered, for the most part, highly creative people.

3.5   Forces of Evolution and Creativity

What would be the point in asking what makes a human a human, if we already know – in light of archeological and biological answers evidenced in the last two centuries – the very origins of our species? One answer to this question would be, because, even though governed by more-or-less the same evolutionary laws as all other animals, it was only humans that could develop unparalleled abilities that allowed us to alter our environment so effectively. Almost all other animals, in contrast, exhibit behavior patterns solely in response to stimuli from their immediate environment. Yes, there are other species that engage in creative behaviors; for instance, using objects to retrieve food – which marks also the earliest evidence for human creativity. However, all such instances would pale by comparison to the creative achievements of Homo sapiens. (Gabora & Kaufman, 2010; Stanford, 2019; Kozbelt, 2019)

So, it is now just to say that creativity is ostensibly a human-specific capacity. This capacity evidently emerged via the overwhelmingly long evolutionary process in "fits and starts," and its existence relied on the development of other cognitive abilities such as consciousness, language, and, more generally speaking, superior information processing. Biological evolution theories have provided a vast repertoire of metaphors and concepts

for creativity researchers. Since both the process of evolution and manifestations of human creativity stem from high complexities that result in novelty, they could be argued to have an intertwined relationship. (Kozbelt, 2019)

The first of the evolutionary approaches to creativity was conceptualized by Campbell (1960), and it has ever since continued to garner a great deal of attention, having been revisited and developed by creativity scholars (Hennessey & Amabile, 2010: p.589). Creativity had always been discussed in abstractions until Charles Darwin theorized the processes underlying the basic principles of evolutionary theory. Diversity, adaptation, and their intertwined relationship to natural selection brought the essential characteristics of creativity to life: solving problems, successful adaptations, and individual in character (Runco & Albert, 2010: p.12). The process of biological evolution has three requisites; heredity, selection, and variation (Blackmore, 2001: p.227).

3.5.1   Natural Selection

The consensus is that the struggle for survival is, for the most part, the driving force behind natural selection: certain physical or behavioral attributes naturally develop in response to changing environments, and this in turn increases the likelihood of those with such adaptive traits to survive and pass on their genes. Consequently, their offspring become better adapted to their environment compared with previous generations. Eventually, successful traits that have proven to increase the overall survival likelihood for generations (fitness) will on average be the most typical characteristics of a species. (Blackmore, 2001; Gabora & Kaufman, 2010; Feist, 2019; Kozbelt, 2019)

According to several creativity scholars, it is rather conceivable to suggest that natural selection and creativity have a mutual relationship when it comes to applied forms of creativity such as in natural sciences or technological advances. For instance, the invention and development of weapons could be argued to have emerged "as a creative response to a need for protection from enemies and predators" (Gabora & Kaufman, 2010: p.290-292). However, some (e.g., Feist, 2001) argued that the same argument may not hold as firmly in ornamental or aesthetic forms of creativity like dance, music, or art. Darwin himself admitted that the theory of natural selection was insufficient to explain every natural phenomenon, so he proposed two other forces that affect the course of

evolution: sexual selection and random genetic mutations (cited in Kozbelt, 2019: p.117).

3.5.2   Sexual Selection

The theory of sexual selection describes a widespread phenomenon observed in the animal kingdom. In most species, the females make the greater portion of the overall investment in the offspring; therefore, they must be selective with their mates to make sure that they can give their successors an edge in the evolutionary race (Kozbelt, 2019: p.118). Males of the same species, on the other hand, compete for mating opportunities by displaying their survival traits (Feist, 2019: p.355).

According to Gabora and Kaufman (2010: p.291), creative traits are perceived to be "metabolically expensive, hard to maintain, not easily counterfeited, and highly sensitive to genetic mutation because they are the most reliable indicators of genetic fitness." Geoffrey Miller – according Kozbelt (2019: p.118), "the most prominent contemporary exponent of sexual selection in the realm of human creativity" – contended that attributes like intelligence, musicality, wit, or creativity are regarded as attractive qualities in men because they are perceived as fitness indicators. He suggested that sexual selection, compared with natural selection, plays a more prominent role in shaping uniquely human endeavors, such as art, music, humor, sports, and storytelling; such cultural displays develop because of reproductive rather than survival needs. His argument has its roots in the evolutionary theory, for Darwin himself wrote: "it appears probable that the progenitors of man, either the males or females or both sexes, before acquiring the power of expressing mutual love in articulate language, endeavored to charm each other with musical notes and rhythm" (1871: p.880, cited in Gabora & Kaufman, 2010: p.291).

There is experimental research supporting such accounts. For instance, Griskevicius, Cialdini, and Kenrick (2006, cited in Kozbelt, 2019: p.119) instructed their participants to write captions for a supposed chance to have a form of romantic relationship, and they subsequently measured the participants' creativity levels. They found that men wrote considerably more creative captions when they had the opportunity for both short-term and long-term romance, whereas women became more creative when primed for a long-term relationship with a trustworthy partner. Despite the consensus concerning the relationship between sexual-selection and creativity, there are counter voices that reject

sexual-selection as an explanation for human creativity (e.g., Rothenberg, 2011, cited in Kozbelt, 2019). For instance, one counter argument is that creative individuals, as pointed out earlier in this paper, are less likely to have children.

3.5.3   Blind Variations

Another factor that influences the course of the biological evolutionary process is random genetic mutations, whereby changes occur in a blind fashion, without any predetermined trajectory (Gabora, 1996; Feist, 2001). Kozbelt (2019: p.120) considers this to be one of the most important applications of evolutionary concepts in theories of creativity. Ribot (1900, cited in Becker, 1995: p.222) argued that individuals cannot consciously summon creativity when in need, because they themselves are unaware of the processes that lead to creative insights. As it was also asked and tried to be answered by Cropley and Cropley (2010: p.306), how then do novel products emerge?

One argument was that (Campbell, 1960, cited in Kozbelt, Beghetto, & Runco, 2010: p.36; Kozbelt, 2019: p.120) ideas are first associated and combined below the threshold of awareness, randomly, so-called Blind Variation, and only then the most relevant and interesting combinations are consciously selected and developed into creative products. Almost two decades later, Austin (1978, cited in Cropley & Cropley, 2010) built on this by identifying four kinds of "happy chance" that leads to creativity:

> […] blind chance [1] (the individual creator plays no role except that of being there at the relevant moment); serendipity [2] (a person stumbles on something novel and effective when not actually looking for it); the luck of the diligent [3] (a hardworking person finds in an unexpected setting something that is being sought […]; self-induced luck [4] (special qualifications of a person – such as knowledge, close attention to detail, or willingness to work long hours – create the circumstances for a lucky breakthrough). (see Cropley & Cropley, 2010: p.306)

However, blind variation accounts are criticized for overemphasizing the role of chance factor in explaining the success of eminent cultural products. For instance, Simonton (2004, cited in Kozbelt, Beghetto, & Runco, 2010: p.37) argued that what is perceived as chance could include "not only stochastic conceptual combinations, but also virtually any psychological or social factors" that are not yet comprehended. For instance, although case studies found that highly creative individuals "enjoy a combination of all four kinds of luck" that Austin proposed, the diligent (3) and self-induced luck (4) accounts suggest that knowledge and hard-work factors may play a bigger role than happy coincidences

(Cropley & Cropley, 2010: p.306). Furthermore, Gardner (1999, cited in Hennessey & Amabile, 2010: p.589) advised creativity scholars to acknowledge that blind variation accounts imply that the individual tries out, consciously or unconsciously, every imaginable idea while searching for an optimal solution to a problem.

Despite such criticisms, research shows that, due to the complexity of the underlying processes that lead to creativity, creators have little control over the magnitude of the impact their end products will have. Therefore, mass-production, Kozbelt (2019: p.121) argues, "is the optimal strategy for those seeking eminence; indeed, great creators are almost always very productive, besides having a large, idiosyncratic knowledge base."

3.6   Sociocultural Approaches

Most of the publications on creativity in the last century have been written by psychologists, looking solely at the individual level. These studies were guided by the metaphor of the mind as a computer and focused on the inner workings of this machine; however, although the metaphor has been very fruitful in the past, recent findings in neuropsychology have shown that the brain is highly plastic and strongly shaped by the ever-changing social environments (Stanford, 2019: p.7).

Explanations that reduce the phenomenon of creativity to the level of the individual are by no means universal; many cultures do not even have a concept of creativity, while in others the perceptions of the phenomenon are entirely different (Csikszentmihalyi, 1999; Lubart, 1999, 2010; Sawyer, 2006; Smith & Carlsson, 2006; Hennessey & Amabile, 2010; Long, 2014). So, it would be just to argue that creativity is culturally defined; ergo, creativity is not only a psychological but also a social and cultural phenomenon, requiring scrutiny from various scientific disciplines (Simonton, 2019: p.462). The sociocultural approaches are of vital importance to understand creativity in its entirety.

Each person in a society is a member of several interdependent social groups with different structures and cultures, and the collection of all such groups forms a society. Therefore, even studies that are thought to be exclusively studying creative personality traits or creative processes are directly or indirectly shaped by sociocultural factors (Lubart, 1999; Sawyer, 2006; Sternberg, 2006; Hennessey & Amabile, 2010).

Sociologists are scientists who study these structures and aim to explain how a group of people come together to tackle problems that exceed any one individual's capabilities; Anthropologists are scientists who aim to uncover the hidden, unspoken cultural rules, and over the last several decades, they have contributed immensely to the universal understanding of creativity (Sawyer, 2006: p.114).

3.6.1   Origins of Creativity

Gabora and Kaufman (2010: p.279) asked what it is that makes humans so creative, even though the anatomy of the human brain is not necessarily so different from that of the great apes. They then suggested that we could answer this question by studying relics of the past with the aim of understanding the thoughts, beliefs, and creative abilities of our ancestral species who used them.

Based on fossil evidence, scientists can make reliable estimations regarding the evolutionary development of the hominin brain, studying the structural and organizational changes that have been taking place over millions of years. Given the synchrony between anthropological and fossil evidence, "it is tempting to impute a simple causal relation between" biological evolution and human creativity, which suggests that structural changes in the human brain enhanced the tool-making abilities of hominins, and each ancestral species of modern humans had their distinctive tool of choice (Kozbelt, 2019: p.115).

Evolutionary branch of the ancestral humans, hominin, diverged from that of ancestral chimpanzees, our closest surviving relatives, approximately 6 million years ago in eastern Africa. Australopithecines had a cranial capacity of about 450 cc – the volume of the interior of a skull with a brain, one indicator of intelligence. It is roughly the size of chimpanzee or gorilla brains, which is about one-third of the modern human average of 1,500 cc. Australopithecines, the first of our ancestors, had no creative capacity, nor did they construct any kind of tools. (Gabora & Kaufman, 2010; Kozbelt, 2019)

3.6.1.1   Homo Habilis

The first of the homo lineage, homo habilis, "handy man," emerged approximately 2.5 million years ago. Homo habilis' cranial capacity was 610 cc, and although that is less

than half that of modern humans, it was still significantly more than that of their closest ancestor. In addition to this increase in size, there have also been organizational changes in the brain – for instance, in the regions associated with speech production. These early hominids are believed to had only sensory perceptions, and thus they were only concerned about the present moment. According to archaeological records, homo habilis marks the beginning of human creativity as they were the first species ever to build something that did not exist before: single-faced stone axes known as Oldowan tools, which are believed to have been used to split nuts and hard-shelled fruits. (Gabora & Kaufman, 2010)

In light of archaeological records, during the several million years of hominin evolution, there has always been a trajectory starting with the biological development of the human brain, followed by a state where new cognitive abilities are acquired, and ending with the manifestations of creativity via tool making. It is of importance to note that at the end of such trajectory, when in transition from one generation to next, there always seemed to be a prolonged state of equilibrium or inactivity in the evolution of the brain and cognitive abilities, and consequently a decline in the ubiquity of creative expressions. (Lewin & Foley, 2004; Kozbelt, 2019)

3.6.1.2 Homo Erectus

After one such stasis, approximately 1.8 million years ago, Homo erectus came into existence. The brain of a homo erectus was about 1050 cc, which is roughly 70% that of modern humans. Concerning cognition, with the help of further changes in neural activity and fine refinements in memory, Homo erectus moved from an episodic mind that depended on external cues to recall past information to a mimetic mode of functioning whereby a piece of information could be self-triggered, thus allowing them to predict the probability of future events. Therefore, they were able to prepare themselves accordingly for not only immediate threats but also for future threats. This was the first time a hominin could escape from "here and now" and develop an internal worldview based on their subjective experiences. However, they were yet to have the metacognitive ability. Moreover, although the anatomical capacity for language had already been present at the time, verbal communication is believed to be restricted to some type of protolanguage. (Gabora & Kaufman, 2010: p.281; Kozbelt, 2019; p.113)

As a consequence of this groundbreaking cognitive awakening, Homo erectus impressed with its creative and adaptive abilities. Homo erectus marked the first instant when hominins migrated out of Africa, settling across Eurasia. Their expeditions led to confrontations unfamiliar to them, which in turn gave rise to the development of tools for hunting and protection purposes, as well as to novel collaborations among the conspecifics. (Gabora & Kaufman, 2010)

They built upon the Oldowan tools, and the result was Aschulean hand-axes, symmetrical sharp-edged stone tools. This upgraded version is believed to have required exceptional cognitive coordination and spatial ability. Moreover, these hand-axe tools may have even had hierarchical significance, as there is strong evidence to believe that Homo erectus lived in a hunter-gatherer society with complex social structures, and these tools were sometimes built in sizes so big that they could not have been of any practical use. Archaeologists Kohn and Mithen (1999) proposed that such gigantic specimens must have been built to demonstrate the cognitive fitness of the individuals who built them, because, according to Kohn and Mithen, the process of shaping a solid rock into an axe form must have been an extremely cumbersome process for the prehistoric man. Unarguably the most indisputable creative achievement of Homo erectus was the domestication of fire. They were the first ones to use fire to cook food, which, according to some scientists, was the main ingredient for human creativity, as it revealed a whole new set of nutrients that laid the groundwork for a superior brain. (Kozbelt, 2019)

3.6.1.3 Homo Sapiens and Creative Explosion

Between 600,000 and 150,000 years ago, the cranial capacity and the brain to body ratio reached modern human levels (Kozbelt, 2019; p. 114), and anatomically modern humans ultimately arrived roughly 180,000 years ago, somewhere in eastern Africa (Lewin & Foley, 2004). But this final increase in the size of the brain did not directly translate into more intellectual capacities and, by extension, into creativity. This time, organizational changes in the brain that had previously led to novel intellectual realizations and abilities continued to develop independently from the brain's overall size (Gabora & Kaufman, 2010: p.283). Eventually, some 40,000 years ago, humanity experienced its own cultural creative big bang (Lewin & Foley, 2004).

There was an explosion of creativity in every aspect of life. There are traces of burial sites, suggesting the existence of ritual beliefs; there is evidence for the existence of dance; these early Homo sapiens adorned themselves with body decorations; they used an extensive repertoire of tools for hunting and other everyday chores. They played musical instruments and even created visual arts – surprisingly realistic cave paintings of animals at Chauvet cave, which dates back roughly 35,000 years, and so-called Venus figurines are two of the most striking examples of early sapiens creativity. It is, however, worth noting that there are even earlier examples of human creativity such as Berekhat-Ram or Tan-Tan 8figurines, both of which believed to date back 100,000 to 200,000 years – although such discoveries are isolated instances. There is always the possibility that earlier demonstrations of creativity did not survive to leave archaeological traces. (Kozbelt, 2019: p.115)

In any case, current evidence suggests that sometime between 60,000 and 30,000 years ago, there was a never been seen ubiquity of creativity all over the world mediated by the modern human mind. For example, while any significant changes in toolmaking were previously measured in several hundreds of millennia, after this explosion, new tools started to appear all around the world every ten millennia or so. When the dust settled, this period produced more novelty than the preceding 6 million years of hominin evolution. Approximately 10,000 years ago humans invented agriculture and the wheel; written languages developed roughly 6,000 years ago; around 4,000 years ago mathematics and astronomy came into the picture; the first surviving examples of philosophical works date back 2,500 years; invention of the printing press dates back 1,000 years; and approximately 500 years ago the modern scientific methods were finally born (Gabora & Kaufman, 2010: p.282, 287).

There has been no shortage of explanations for this creative explosion. Some of these were argued by evolutionary psychologists and neuroscientists, focusing on biological and cognitive factors behind the creative mind and suggesting that the "take-off points" in the historical evolution of creativity stemmed from genetic changes that endowed humans with new capabilities (Stanford, 2019: p.8).

One such hypothesis suggests that the cognitive ability to shift between implicit and explicit modes of thought gave birth to a stronger memory – while *implicit thought* can

be equated to divergent thinking, *explicit thought* can be equated to convergent thinking. Implicit thought is proposed to be evolutionarily older than explicit thought, and is believed to have allowed Homo sapiens to detect complex regularities in their environment and to make broader associations based on their idiosyncratic worldview. Explicit mode of thought, on the other hand, is associated with more contemporary skills such as planning and deliberate reasoning. According to this hypothesis, the ability to use these complementary cognitive styles simultaneously and to switch between them – when combined with greater memory – may have been what catalyzed the unparalleled creative insight of Homo sapiens (Gabora & Kaufman, 2010)

On the other hand, other types of explanations de-emphasize the biological factors and argue that culture develops alongside but independently of biological evolution; such studies are predominant in the humanities and social sciences. Cultural evolution theories posit that higher intellectual faculties of early sapiens, which allowed for creativity, have themselves evolved through culture in response to never-before-experienced complexities and challenges of social life (Gabora, 1996; Dennett, 1998; Blackmore, 2001; Gabora & Kaufman, 2010; Stanford, 2019). Dunbar's (1998) rather famous social brain hypothesis, in which he argued that it was the information-processing demands triggered by larger social networks that caused the neural activity acceleration in certain parts of the brain, and Cupchik's (2016) work, in which he identified culturally mediated social changes as the reason behind the need to integrate implicit and explicit thoughts, are two of the more prominent studies that focus on culture's significance in the development of the human brain (cited in Kozbelt, 2019: p.115).

Such accounts have been criticized for their "willful disregard of evolutionary and psychological principles" (Kozbelt, 2010: p.119). Also, while assessing such theories, it is worth remembering that both the hominin fossil remains and creative expressions (e.g., hand tools) deteriorate over time; ergo, the archeological evidence may sometimes be incomplete or may be still developing as archaeologists and anthropologists refine their findings (Gabora & Kaufman, 2010: p.280). Moreover, we can at best make approximation regarding the individual and social behavioral characteristics of prehistoric humans.

Despite such criticisms, Stanford (2019: p.4-5) suggested that cultural evolution theories

simply offer a toolkit to study what happens inside brains when humans interact with one another, and as Kozbelt (2010: p.116) admits, the theory of human cognition evolution comes "from a reasonably coherent narrative," however "retrospective and simplified" it may be.

3.6.2   Cultural Evolution and Creativity

The core idea behind cultural evolution is easy to grasp: humans inherit not only biological but also cultural information (Gabora & Kaufman, 2010: p.288). Philosopher Daniel Dennett (1998: p.1) – who was awarded the prestigious Erasmus Prize for being able to elucidate the cultural ramifications of science and technology to a broader audience – explained that culture is composed of all the languages, myths, music, arts, tools, and any other kind of practices or routines that exist at any one point in time and that all these phenomena change, merge, or disappear over time. He then concluded that "A verbatim record of this history would not be science; it would be a database. That is the truism: cultures evolve over time." Cultural evolution scholars argue that mathematical models for evolution can be applied not only to genes but also to other forms of information transmission (Stanford, 2019: p.9).

3.6.2.1   Information Creation

In his book, The Selfish Gene, Richard Dawkins (1976, cited in Dennett, 1998; Blackmore, 2001) coined the term "meme" and defined it as the unit of cultural inheritance (information), analogous to the gene. Memes are described as the building blocks of culture itself (Csikszentmihalyi, 1999: p.317; Blackmore, 2001: p.227). In Dawkins' own words: "memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots, or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperms or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broad sense, can be called imitation" (1976, cited in Blackmore, 2001).

In biology, genes are defined as evolving information-bundles and variations occur through combinations and mutations, and maladaptive and obsolete variations cease to exist through natural selection (Gabora, 1996: p.903). Whereas genetic information is inherited through chromosomes, the information contained within a meme is transmitted

through learning (Csikszentmihalyi, 1999: p.317). Memes evolve through selection, variation, replication, and transmission (Gabora, 1996: p.917).

Sawyer (2006: p.147) suggested that the reason why culture is always changing is that culture itself is fundamentally creative. He argued that (p.139) what makes creativity the foundation of culture is that cultural transmission is never a "mechanical replication of the past" because there is always someone new conceptualizing a specific idea within the boundaries of their own idiosyncratic worldview, contributing to the evolution and reproduction of that meme.

Indeed, the capacity for innovation is often argued to be the bottleneck in the cultural evolutionary process (Gabora, 1996: p.917). Csikszentmihalyi (1999: p.317-318) suggested that it would be useful to think of creativity as changes in memes because, for the most part, these discrete elements of culture remain intact as they transmit themselves from one host to another. He explained that for hundreds of thousands of years, hominins produced exact copies of the same stone blades, and then one day, a more efficient way of carving stone was discovered. From that moment on, the instructions for this novel method of shaping stone began to proliferate itself in the minds of people, generating offspring.

Over the past several decades, numerous creativity scholars have studied the systems and processes through which creative ideas change and develop over time as they pass from one individual to another (Gabora, 1996; Dennett 1998; Csikszentmihalyi, 1999; Blackmore, 2001; Feist, 2001, 2019; Gabora & Kaufman, 2010; Hennessey & Amabile, 2010; Kozbelt, 2010, 2019). The creative idea is the cultural equivalent of the individual in evolutionary biology, argued Gabora and Kaufman (2010: p.289). Every new generation begins with the transmission of an idea from its originator, person A, to person B and continues until it is transmitted to the next person in line. Between the time person B learns a meme and passes it onto person C, variations arise, and the sources of these variations have been explained in evolutionary terms.

Cultural evolutionary theories posit that social norms and behaviors do not variate or remain stable at random; variations occur either through biased transmission as hosts reorganize and re-associate information bits constructing an idea in accordance with their

own worldview, or due to unconscious copying error during transmission, which is reminiscent of random genetic mutations in evolutionary biology (Gabora, 1996; Dennett, 1998; Blackmore, 2001; Stanford, 2019).

3.6.2.2   Natural Selection

Memes and genes have been coevolving; some cultural norms "remove the pressure for genetic adaptation, and even change the adaptive environment to which genetic change responds" (Stanford, 2019: p.2). Blackmore (2001: p.225) called this process memetic drive, and suggested that "meme-gene coevolution produced a big brain that is especially good at copying certain kinds of memes." The human brain, Blackmore (2001: p.226) argued, has evolved by continually solving the problem of choosing which successful memes to imitate in order to successfully overcome natural selection. First and foremost, our primitive but still indispensable needs (e.g., food, safety) have all biological basis; thus, a multitude of memes are products of biological evolution (Gabora, 1996: p.910). In other words, the topology of the memetic fitness landscape largely echoes that of the biological fitness landscape.

Not all ideas see the light of day. Ideas and practices that enable us to overcome challenges in our environment proliferate and flourish throughout society; others, not so much (Gabora, 1996: p.901). As they are transmitted from one host to another, ideas are refined and made more effective, thus increasing their complexity. In this sense, both creativity and evolution could be described as the increase in complexity over time (Csikszentmihalyi, 1999: p.320). When someone develops a novel product, it inevitably builds on the already existing ideas and inventions of others. However, according to Gabora and Kaufman (2010: p.287-288), what makes human creativity reminiscent of biological evolution is the "adaptive and open-ended" nature in which such changes accumulate; ideas build onto one another in ways that meet our needs, desires, and goals. For instance, as Gabora (1996: p.910) pointed out, the invention of cars, for example, set off other interdependent "cultural niches" such as gas stations, seat belts, or car mechanics.

When someone discovers a better method for catching fish, it helps to provide more fish more consistently, thereby increasing the genetic fitness of those who learn the

instructions of those who learn this new method (Dennett, 1998: p.4). When parents pass on their traits to their offspring, transmissions often occur through guided instruction or imitation. Natural selection explains this phenomenon as *vertical transmission* (Lewens, 2018: p.2). However, in cultural evolution transmissions do not only happen between parent and the child nor does it even have to be between conspecifics; for example, as Gabora (1996: p.917) elegantly illustrated, a child could learn how to peel a banana by watching her mother or another mammal, or from a cartoon character on the internet. The outcome is the same; the child now has a mental representation of how to eat a banana. This is known as *horizontal* or *oblique transmission* (Lewens, 2018: p.2).

3.6.2.3   Blind Imitation

Traditionally, social sciences premised that cultural practices would survive so long as they provided some form of fitness advantage or served some social function; however, today, it would be an aphorism to say that many customs actually do live on even after their contexts fall away (Stanford, 2019: p.4). For instance, when we consider the current popularity of food products that are high in fat or sugar among populations, we should assume that such a diet is of benefit to humans. Historically speaking, this is an accurate argument, considering the fact that our ancestors were only able to eat occasionally and needed food high in energy to sustain themselves biologically; however, given the ubiquity of food in the Western world and our not-so-active contemporary lifestyle, once such crucial dietary habits have now become detrimental to our overall genetic fitness because of excessive consumption, causing many health-related problems (Dennett, 1998: p.4; Lewens, 2018: p.1).

Many cultural routines are adopted based on unconscious selective mechanisms. Robert Boyd (2018, cited in Stanford, 2019: p.2), one of the founding fathers of the cultural evolution discipline, emphasized the role of blind imitation as an explanation for the diffusion of innovations throughout a population. He argued that we become better adapted to our environment not by attempting to acquire memes that have proven to increase overall fitness but rather through an evolutionary process mediated by blind imitation. For example, to satisfy our desires, we may copy the habits of high-profile individuals in the hopes that they may be success related (Lewens, 2018: p.2; Stanford, 2019: p.2). To sum up, "some traits spread through a population in spite of the fact that

they reduce the fitness of the individuals who bear them" (Lewens, 2018: p.2).

Dennett (1998: p.4) argued that in the short run, evolutionarily speaking, something may develop independently of whether it is of benefit to the host. He reminded us that in biology, symbionts are classified into three main categories: parasites, which decrease the fitness of their hosts; commensals, whose presence is neutral; and mutualists, whose presence improve the fitness of both their own and the hosts. This is used as an analogy for cultural evolution and creativity; while some ideas increase the fitness of the host or society in general, others are likened to parasites or viruses infecting their hosts (Dennett, 1998: p.3; Blackmore, 2001: p.228). According to Dawkins (1982, cited in Gabora, 1996: p.922), the survival likelihood of ideas depends on both the character of the society in which they are introduced and the type of memes that already exist in that society. Even though they may have arisen directly or indirectly from humanity's needs and desires, memes do not always promote survival; just like importing some foreign plants may cause ecological problems, embracing particular foreign memes may "disrupt the established network of relationships amongst existing memes" (Gabora, 1996: p.921-922).

Cultural evolution scholars view the mind as a memetic host; we generate, select, and replicate information patterns. All sorts of interactions between a host and its environment construct the worldview, a collection of memes from every branch of knowledge imaginable (Csikszentmihalyi, 1999; Stanford, 2019). Our worldview evolves through culture and creative products reflect the states of the particular worldview that generate them (Gabora, 1996; Gabora & Kaufman, 2010). Indeed, both Eastern and Western neuropsychology disciplines traditionally postulate that "the ontogeny of the human brain is, from beginning to end, necessarily shaped by interaction with the individual's social environment" and with cultural artefacts (Stanford, 2019: p.6) – enculturation may even begin before birth (von Raffler-Engel, 1993).

Kozbelt (2019: p.120) argued that if our intention is to further develop our creative capacity, it is of vital importance that we understand the dynamic relationship between biology and culture. Cultural evolutionists advocate that we need to relinquish our individualistic approach to creativity because psychology in itself should be viewed as fundamentally cultural (Stanford, 2019: p.9).

3.6.3 Social Environments

As stated previously, our current conceptions of creativity in the western world are still heavily influenced by the romantic images of starving or glorified artists of the 19th century, and we expect artists to either rise or fall as individuals. However, as Sawyer (2006: p.119) diligently pointed out, today the most influential forms of creativity – e.g., films, episodic shows, music, games, computer or mobile apps – are all achieved not by any one individual but a group of people working together. Therefore, Gabora (1996: p.901) argued that learning everything there is to learn about how ideas develop in the minds of individuals is not enough to reveal and understand the underlying sociocultural beliefs and assumptions that shape ideas.

Csikszentmihalyi (1999: p. 317) pointed out that "there are over a hundred different definitions of culture being used by anthropologists" and he argued that he himself sees culture as systems of interrelated domains. Sawyer (2006: p.137) argued that culture influences creativity through its domains. Novelty is a notable variation in the evolution of any one meme operating in any domain; it is a change that will be transmitted through space and time, and appropriateness is its meaning and value for culture and society (Csikszentmihalyi 1999; Sawyer, 2006; Hennessey & Amabile, 2010; Stanford, 2019).

For an idea to be recognized as creative, it must significantly alter the status quo of a domain; it needs to collectively change the way people in a given field – and sometimes even society at large – operate. Creative contributions that result in innovations in any domain may reach even wider audiences by first spreading to other domains, then to different cultures, and finally to society at large. Therefore, the sociocultural perspectives presuppose "a community of people who share ways of thinking and acting, who learn from each other and imitate each other's actions." (Csikszentmihalyi, 1999: p.316-319)

Cultures or society at large can contain elements that may either foster or stifle creativity (Lubart, 1999: p.339; Sternberg, 2006: p.90). There is a number of interconnected social environments that affect the occurrence of creativity: family, school, workplace, and culture. These social systems shape how individuals interpret information by determining what restraints should be placed on individual and group behavior and how much tolerance there should be for novelty (Kozbelt, Beghetto, & Runco, 2010: p.40).

3.6.3.1 Fields

The effect of domain specific knowledge on aesthetic judgment is studied by researchers. Teresa M. Amabile and Mihaly Csikszentmihalyi are often credited for being two of the first to point a finger at the imperfections in early creativity studies aiming to measure creativity levels of individuals. In her book, Creativity in Context, renowned creativity scholar Amabile (1983, cited in Lubart, 1999: p.340; Sawyer, 2006: p.121) brought to attention that in early creativity studies the assessments were almost always made by the academics conducting the studies.

Research has found that the more trained the evaluators are, the more they agree on what is creative and what is not because experts are much more knowledgeable about the conventions of their domains (Sawyer, 2006: p.124). Today, the assessment of creativity is made by a group of professionals trained in relevant domains; for instance, if what is measured is the creativity levels in drawings or paintings, then the assessment is made by art teachers (Csikszentmihalyi, 1999: p.324).

Csikszentmihalyi (1999) revisited the systems model that had been proposed by himself a decade earlier, placing more emphasis on the collaborative nature of creativity. He argued that creativity judgments emerge via three interconnected elements: 1) the domain, which refers to all the accepted knowledge surrounding any one discipline at any one point in time; 2) the individual, who creates a variation in any popular idea in a domain; and 3) the field, the social aspect of a domain, which is comprised of experts and peers within a given discipline who decides which proposed memes are worth preserving for future generations. There have, however, been voices calling attention to the fact that "the qualitative nature of many aspects of [Csikszentmihalyi's model] may make it more difficult to test hypotheses unambiguously" (Kozbelt, Beghetto, & Runco, 2010: p.40).

Csikszentmihalyi (1999: p.321) defined society as the sum of all individuals operating in all fields and explained that "Fields are made up of individuals who practice a given domain and have the power to change it." Members of fields are subjugated by and adhere to paradigms and guidelines practiced in their respective domains, and once there is a consensus among the members of a field that a product's quality and appropriateness meet the domain's criteria, the product is considered creative and gets included into that

domain; rejected ideas, on the other hand, may never see the light of day (Sawyer, 2006: p.122-124).

The number of members that make up a field varies tremendously. Depending on the domain or on the impact of the idea, experts, peers, or society at large may constitute the field. For instance, in physics, the opinion of a tiny group of pundits consisted of university professors determine whether a theorem or theory is original or not; some think that in the United States, approximately ten thousand people from New York constitute the field of modern art, deciding which works of art deserve to be acknowledged as creative and to be displayed. (Csikszentmihalyi, 1999)

On the other hand, in many other cultural/creative domains, the field is made up of the society at large, and the value of a cultural product needs to be decided upon collectively for it to make financial sense for investors – the more popular a book becomes, the more it will sell. This weakens the hand of expert members of the field (for example, film critics) in persuading the wider public which cultural products are original and invaluable cultural assets. Consequently, it is of utmost importance to point out that, regardless of the domain, resolutions of a field are often guided by conventional intermediaries such as investors, publishers, advertising agencies, internet conglomerates, authorities, politicians, et cetera. (Sawyer, 2006)

"Cultures differ in the number of domains they recognize and in the hierarchical relationship among them." Some domains subsume other domains and decide for them which novel ideas they should allow in and implement. For instance, for a very long time, the artistic works were evaluated by the field of the religious domain rather than independent aesthetic fields. The church commissioned such works, so they had the final say. Moreover, fields can be subjugated by political power, as in most of the authoritarian regimes. For example, it is the party officials who dictate which cultural products and even scientific theories will be adopted by society at large. Domains that are autonomous from the rest of the domains that operate within a social system are in general more favorable towards change, since the field is only responsible for the domain they serve, rather than the society at large. Therefore, it is safe to argue that fields need a certain degree of autonomy to be able to make their evaluations based only on the principles of their domains, free from extraneous opinions. (Csikszentmihalyi, 1999: p.317-326)

Some researchers questioned the significance of fields by pointing out instances where the fields are sometimes wrong. For example, sociologist and cultural industries scholar Bernard Miège (2011: p.86) pointed out that investors spend billions every year on cultural and informational goods that are unsuccessful and distributed only in small quantities for failing to grab the attention of the broader public, despite being created and marketed by professionals. Year after year, scientific journals publish articles that will never be recognized or cited by other scholars, even though they were selected for publishing by experts in the domain (Sawyer, 2006: p.126). Others suggest that history is full of individuals who were not acknowledged by their respective fields in their own time, such as the obsessively overused example of Van Gogh.

Despite the criticisms, quantitative research proves that reputation in science, arts, and humanities remains astonishingly stable over the years; in other words, it is very rare for individuals to be re-evaluated as revolutionary after their time (Sawyer, 2006: p.126). For example, books that were critically acclaimed in 1920 are praised by the field also today; likewise, no films which went unnoticed in the 1950s started to be, all of a sudden, recognized as creative in the 2000s.

3.6.3.2 *Environmental Factors*

A great deal of empirical research has focused on the role of environmental factors in the creation of novelty (Sawyer, 2006: p.139; Smith & Carlsson, 2006: p.205). Gabora (1996: p.922) wrote that: "We can control the birth of ideas only to the extent that we provide a fertile ground for them." Although there are individual variations in environments favored by creative people, the consensus is that creativity thrives when there is room for exploration and experimentation and when originality is valued (Hennessey & Amabile, 2010: p.581; Kozbelt, Beghetto, & Runco, 2010: p.25). A person may possess all the necessary internal conditions that allow creative thinking, but their creativity will never become apparent if they lack certain external conditions (Sternberg, 2006: p.89).

Creativity scholars explored the reasons why some societies in history were more successful in nurturing genius. For instance, why was it that the burst of creativity during the Renaissance concentrated only in a handful of countries across Europe? The 15th-century Italy, for example, was the center of trade routes between the West and the East,

which brought in a lot of wealth; the middle class was educated, there was, therefore, an overall appreciation of arts across the society, which encouraged the royals and church to spend more resources on art. After the fall of the Byzantine Empire, the Western Roman Empire became an attractive spot for the intellectuals and artists fleeing the East. "Legendary creativity researcher" Mihaly Csikszentmihalyi had realized early on that all or some of these economic, social, and political factors must have led to the proliferation of creativity seen in 15th-century Italy. (Sawyer, 2006: p.122)

Throughout history, novel ideas emerged usually in societies at the confluence of different cultures due to the convergence of divergent worldviews, where people coming from various cultural backgrounds could interact and exchange opinions, argued Csikszentmihalyi (1999: p.319). Some researchers have explored the potential stimulative effects of multiculturalism on creative thinking. Hennessey and Amabile's (2010: p.588) research showed that there are empirical studies demonstrating that exposure to different cultures can, in and of itself, positively affect cognitive processes conducive to creative thinking. For instance, scientists agree that language shapes our thoughts and structures our understanding of the world and by extension, creativity (Lubart, 1999: p.344).

Lubart (1999: p.345) argued that bilingualism could foster creativity for several reasons. First, bilinguals have a higher metalinguistic awareness for being situated in two different linguistic conceptual networks, and thus they have at their disposal a more diverse set of associations between words and concepts. Second, bilinguals usually have a greater tolerance for ambiguity – as discussed earlier, a prominent prerequisite for creative personality – because they are used to nuances and differences in the meanings of similar ideas depending on the linguistic community. However, some studies have shown that before any advantage of bilingualism on creative thinking can be seen, individuals first need to reach a certain threshold of bilingual proficiency (Lubart, 1999: p.344). On the other hand, there are others who argue that the capacity for language is not necessary, and may be even inhibitor, for certain types of visual creativity (Hennessey & Amabile, 2010: p.574).

The extent an individual influences a domain may depend on how well they are positioned with respect to that domain. Csikszentmihalyi (1999: p.315) shed light on the fact that some individuals are born into the field of their parents; thus, they receive education on

their domain's norms and rules from an early age. Also, it was found that children whose parents have academic background perform stronger in creative functioning tests (Smith & Carlsson, 2006: p.221).

Maybe to no one's surprise, individuals who are born into wealth will find it easier to turn their ideas into reality, all else being equal. Csikszentmihalyi (1999: p.315) pointed out that some simply inherited socioeconomic privileges, allowing them to spend their childhood playing and experimenting rather than worrying about earthly responsibilities. Also, wealthier societies are better positioned to encourage creative activities by investing in infrastructures like schools, libraries, universities, scientific laboratories, etc. (Csikszentmihalyi, 1999: p.322-324).

This is not to say that it is impossible for genius to emerge from more impoverished corners of the world, but it will be much less likely (Csikszentmihalyi, 1999: p.328). Although genius could thrive in less-than-ideal circumstances, for "men of leisure are rarely great" (Bethune, 1837, cited in Becker, 1995: p.226), given the optimal social circumstances are provided, even those with limited skills can make innovative contributions (Becker, 1995: p.223). Moreover, research on eminent historical figures has revealed that many of them lived on the margins of society; many of them were either isolated by society due to poverty and prejudice or immigrated to the societies in which they lived. "It seems that a person who is comfortably settled in the bosom of society has fewer incentives to change the status quo" (Csikszentmihalyi, 1999: p.328-329).

Economist and social scientist Richard Florida argued that the new centrality of creativity in societies has led to a new segment of society and named it "the creative class" (cited in Hesmondhalgh, 2008: p.561). The kernel of Florida's economic theory of creativity is tolerance, and he believed that since creative people are unconventional by nature, they need to be tolerated by society at large (Kozbelt, Beghetto, & Runco, 2010: p.30). Florida also argued that creative people want to live in creative and free environments, and if governments want to attract these people, they need to make sure they provide such living spaces in their cities (Hesmondhalgh, 2008: p.561). Economic theories of creativity are one of the most decisive for the cultural industries because they propose schemes for designing environments that foster creative potentials.

3.6.3.3 Creativity Across Cultures

Traditionally speaking, everything we know and believe about the phenomenon of creativity in the West is the synthesis of western creation myths and studies. Creativity researchers have realized over the past few decades that when they look beyond their doorstep, they can observe the influences of cultural environments more truthfully because while examining cultures that are different from theirs, scholars become free of their own culture's prejudices (Lubart, 1999, p.346).

Recent cross-cultural studies from around the world have shown that there is a universal consensus about the need for some kind of combination of personal factors indicative of creative thinking, such as certain "cognitive skills (ability to make connections, ask questions, use imagination, think flexibly, experiment with ideas), personality characteristics (e.g., independence, self-confidence, assertiveness), and motivational attributes (e.g., high energy, ambition, enthusiasm)" (Lubart, 2010: p.270).

It is important to note, however, that the effects of culture on creativity are intricate and inclined to change as they include historical and societal cross-cultural factors; therefore, scholars need to pay attention to potential pitfalls and difficulties when studying creativity cross-culturally, argued Hennessey and Amabile (2010: p.591). They reminded that it would be deceptive to assume that the models, paradigms, and theories of creativity envisioned by Western scholars for Western societies could also work for the Eastern conceptions of creativity.

The most popular dichotomy in cross-cultural studies is the West versus East distinction, otherwise known as individualistic and collectivist societies respectively (Csikszentmihalyi, 1999, Lubart, 1999, 2010; Sawyer, 2006; Smith & Carlsson, 2006; Hennessey & Amabile, 2010). Such studies postulate cultural individualism or collectivism as the antecedent variable, self-construals – which in psychology discipline refers to how individuals perceive, comprehend, and interpret other people and the world around them – as the mediating variable, and the creative behavior as the outcome variable (Hennessey & Amabile, 2010: p.588).

The West versus East distinction is believed to derive from the conflicting creation myths

of two different worldviews. Creation myths provide a scaffolding for our implicit conceptions of human creativity. "If Eastern creation (and human creativity) can be characterized as a circular movement in the sense of successive reconfigurations of an initial totality, then the Western view of both creation and human creativity seems to involve a linear movement toward a new point." (Lubart, 1999: p.341)

19th-century creativity and genius scholar Royce (1898) believed individualism to be the primary catalyst behind creativity and suggested that novel products develop when a culture encourages individuality, independence, and private enterprises (cited in Becker, 1995: p.227). The Western societies are characterized as emphasizing individuality and self-reliance; they define "the self as autonomous from the collective," whereas Eastern cultures, in contrast, define "the self within a social context with its norms and obligations," emphasizing obedience, cooperation, duty, and authority (Lubart, 1999: p.345).

The Western creative worker is product-oriented. S/he gains insight about a given topic for a specific purpose – to create innovative products. It is "predatory." The Eastern artist is, on the other hand, less worried about the usefulness of their end product; instead, s/he sees creativity as "a state of personal fulfilment […], the expression of an inner essence." When an Eastern artist wants to gain knowledge about a domain, it is to reach a state of enlightenment, which is reminiscent of humanistic psychology's conceptualization of creativity as part of self-actualization. (Lubart, 1999: p.340)

Several cross-cultural studies have shown that certain Eastern societies place a higher value on tradition and conformity when it comes to certain domains but could encourage diversity and creativity in others. For instance, in a study done by Mar'i and Karayanni (1983, cited in Lubart, 1999: p.342), Arab students were observed to give original and rational responses to the question, "What would happen if mules and other animals which help us plough the farm cease to exist?". On the other hand, however, the answers to a religion-related question such as "What would happen in worship places cease to exist?" were either shallow or resulted in students rejecting to answer the question altogether.

Although many Western creativity scholars seem to huddle up different perspectives of creativity into two opposite camps as West and East, such a dichotomy appears to be

misleading as there are also variations within these two worldviews. The study has found that while many American researchers equate creativity to tangible products, Northern European researchers explain creativity as "an attitude toward life, a way to come to grips with the problems of existence." They also place more emphasis on creative potentials and creative education. (Smith & Carlsson, 2006: p.202)

4   CONCLUSION

Creativity is defined as the ability to come up with ideas or products that are both original and appropriate, and it is the essence and an integral part of everyday activities in cultural industries.

In the 18th century, it was so discovered that when external restrictions are removed, people's individual selves and their originality surfaces, and therefore, when freedom is encouraged, genius and creativity flourish. Although genius may be rare, most people have some talent that can be brought out with support and education, which eventually may even lead to manifestations of Big-C creativity.

Studies on highly creative individuals have revealed that creative thought, contrary to popular belief, originates not from the increased activity in the right region of the brain but rather from the dynamic neural cooperation between all sections. Also, it was found that genetic differences contribute to the variations in brain structures, which in turn creates differences in personality, and certain constellations of personality traits lower the threshold for creative thought. Since one must first learn the existing knowledge in the domain in order to be able to introduce a novelty in a given domain, certain levels of intelligence are necessary to be able to learn the prevailing patterns and information.

The creative process is a mental process in the service of problem-solving and has two main stages: generation of original ideas and evaluation and selection of the most applicable ones. The creative process is guided by several mental operations that can be identified as well as unconscious mental operations that continually solve problems below the threshold of awareness. Different individuals may have different preferences for the order of operations. The two different thinking modes, divergent and convergent, should be consciously employed separately or simultaneously depending on the circumstances.

There are three intellectual skills associated with highly creative individuals. First, the analytical skill allows the individual to evaluate their ideas to establish which of them are worth pursuing further and which are not. Second, the synthetic skill enables the individual to think outside the box and look at problems in unconventional ways by switching between the divergent and convergent thinking modes. Finally, the practical–contextual skill refers to the ability to persuade others of the value of one's ideas.

Numerous personality traits are associated with highly creative individuals in the literature, such as careful observation, mental discipline, greater sensitivity, naiveté, arrogance, impatience, higher intellectual standards, attraction to complexity, high energy, independence of judgment, intuition, self-confidence, a firm sense of self as creative, tolerate ambiguity, willingness to overcome obstacles and to take sensible risks, broad interests, autonomy, and openness to experience. Highly influential people are also more prone to depression and other types of mental disorders. It was argued that the willingness to take risks and openness to new experiences are two common personality traits observed among decision-makers in the cultural sector.

Intrinsic motivation plays a central role in the creativity literature. Research has found that people are more inclined to generate creative solutions when they build a personal relationship with the problem at hand and when they are not expected to be evaluated. However, there are other studies suggesting that if the individual already has sufficient levels of intrinsic motivation, external motivations, such as financial rewards or positive feedback, can contribute to creative expressions.

Research has found that creativity does not occur in a vacuum. Before someone could propose novel ideas that would lead to tectonic changes in any domain's status quo, they first have to acquire a great degree of domain-specific expertise. However, research warns us that too much knowledge may also be counterproductive as it may lead to rigid beliefs and expectations when assessing ideas.

Biological evolution theories have provided a vast repertoire of metaphors and concepts for creativity researchers. Research suggests that natural selection pressures have guided creative solutions in applied sciences or technological advances, whereas sexual selection pressures have laid the groundwork for ornamental or aesthetic forms of creativity like

dance, music, or art. However, creative ideas or solutions sometimes emerge from pure chance, reminiscent of blind variations in evolution theory. Therefore, research suggests that mass-production is the optimal strategy for cultural industries.

Although governed by more or less the same evolutionary laws as all other animals, it was only humans that have shown unmatched signs of creativity; thus, it is safe to argue that creativity is ostensibly a human capacity. There are contradictions in the literature regarding the sources of this capacity, which has evolved over millions of years. Psychologists and neuroscientists often argue that specific physical, structural, and organizational changes in the brain gave rise to our creative capacity; on the other hand, numerous social scientists and humanities scholars hypothesize that our higher intellectual faculties have themselves evolved through culture in response to never-before-experienced complexities and challenges of social life.

Cultural Evolution theories point out that we inherit not only biological but also cultural information, and ideas change and develop over time as they pass from one individual to another. The sources of these changes are either natural selection processes where the prevailing ideas pass on over generations or through blind imitation, whereby people take on ideas and habits adopted unintentionally.

Because creativity can only be understood by studying its two principal components, originality and appropriateness, and since the appropriateness of an idea or a product is defined and decided upon socially, creativity is fundamentally and unmistakably a social phenomenon. Individuals' thoughts and actions influence cultural norms and practices, and likewise, culture influences the thoughts and actions of individuals. There is a number of interconnected social environments that affect the occurrence of creativity: family, school, workplace, and culture. These social systems have elements that may either hinder or encourage creative behavior.

The person may possess all the necessary internal conditions that allow creative thinking, but their creativity will never become apparent if they lack certain external conditions. The consensus is that creativity thrives when there is room for exploration and experimentation. Certain economic, political, cultural, and social, factors lead to the proliferation of creativity across societies. Throughout history, novel ideas emerged in

societies at the confluence of different cultures, where people coming from various cultural backgrounds could interact and exchange opinions.

The literature reveals that there is no single universal understanding of the creativity phenomenon. Cross-cultural studies have shown that the models, paradigms, and theories constructed for creativity in the Western world do not always correspond with the understandings of the phenomenon in the Eastern world. Moreover, research reveals that there are also variations in the conceptualizations of creativity within the Western world.

There are several limitations to this work. First, the questions that have been addressed in this review are by no means new; scholars of creativity have been asking and elaborating on these topics for decades, if not centuries. Second, certain sections and subsections, such as biological foundations and mental disorders, may seem beyond the scope of cultural industries studies at first glance. However, I believe that understanding and relating to the unique predispositions of creative individuals could only be beneficial for decision-makers in cultural industries who work closely with such individuals. Moreover, if we cannot understand creativity in its entirety, including all of its aspects, it is as though we do not understand it at all, and this is not something the cultural industries can afford to ignore.

The most important takeaway of this study for the cultural industries is that "moderation" is the most constructive approach when dealing with creativity. For instance, intrinsic motivations, which are of vital importance for creative insights, could be complemented by external motivational factors. And, although autonomy is an essential resource for creative people, too much independence may lead to unfocused idea generation.

Based on the literature, we could conceptualize creativity as a combination of resources such as cognitive abilities, different modes of thinking, personal variables, and various environmental factors. The most fundamental takeaway of this work on the individual level, to quote Sternberg's most masterful explanation (2006: p.90): "Although levels of these resources are sources of individual differences, often the decision to use a resource is a more important source of individual differences." Therefore, creativity should be understood as a conscious decision, "an attitude toward life, a way to come to grips with the problems of existence" (Smith & Carlsson, 2006: p.202).

5 REFERENCES

Adorno, T. W. (1991). Culture Industry Reconsidered. In: Bernstein J. M. (eds.), The Culture Industry: *Selected Essays on Mass Culture*. London, Routledge, pp. 98-106.

Baer, J. (2010). Is Creativity Domain Specific? In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 321-341.

Blackmore, S. (2001). Evolution and memes: The human brain as a selective imitation device. *Cybernetics and Systems: An International Journal*, Vol. 32, No. 1-2, pp. 225-255. https://doi.org/10.1080/019697201300001867

Bowden, E.M. and Jung-Beeman, M. (2003). Aha! Insight experience correlates with solution activation in the right hemisphere. *Psychonomic Bulletin & Review,* Vol. 10, No.3, pp.730-737. https://doi.org/10.3758/BF03196539

Browning, G. and Kilmister, A. (2006). *Critical and Post-critical Political Economy*. Springer.

Collins, M. A. and Amabile, T. M. (1999). Motivation and Creativity. In: Robert J. Sternberg (ed.), *Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 297-312.

Csikszentmihalyi, M. (1999). Implications of a Systems Perspective for the Study of Creativity. In: Robert J. Sternberg (ed.), *Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 313-336.

Lee, D. (2014). Creative Labour in the Cultural Industries. Available at: https://www.isa portal.org/resources/resource/creative-labour-in-the-cultural-industries/ – Accessed 16.12.2020

Dennett, D. C. (1998). Memes: Myths, Misunderstandings, and Misgivings. Available at: https://ase.tufts.edu/cogstud/dennett/papers/MEMEMYTH.FIN.htm – Accessed

16.12.2020

Doğruel, L. (2013). Opening the Black Box – Conceptualizing of Media Innovation. In: Storsul, T. and Krumsvik, A. H. (eds.), *Media Innovations: A Multidisciplinary Study of Change*. Gothenburg, Nordicom, pp. 29-43.

Feist, G. J. (1998). A Meta-Analysis of Personality in Scientific and Artistic Creativity, *Personality and Social Psychology Review*, Vol. 2, No. 4, pp. 290–309. doi: 10.1207/s15327957pspr0204_5

Feist, G. J. (2010). The Function of Personality in Creativity - The Nature and Nurture of the Creative Personality. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 113-130.

Gabora, L. (1996). A Day in the Life of a Meme. *Philosophica*, Vol. 57, pp. 901-938. Available from: https://www.researchgate.net/publication/239328350_A_Day_in_the_Life_of_a_Meme – Accessed 16.12.2020

Gabora, L. and Kaufman, S. B. (2010). Evolutionary Approaches to Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 279-300.

Hardy, J. (2014). *Critical Political Economy of the Media: An Introduction*. Routledge.

Hennessey, B. A. (2010). The Creativity-Motivation Connection. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 342-365.

Hennessey, B. A. and Amabile, T. M. (2010). Creativity. *Annual Review of Psychology*, Vol. 61, No.1, pp. 569-598.

Hesmondhalgh, D. (2007). The Cultural Industries (2nd ed.). London, SAGE.

Hesmondhalgh, D. (2008). Cultural and Creative Industries. In: Bennett, T. and Frow, J. (eds.), *The Sage Handbook of Cultural Analysis*, pp. 552-569.

Kim, K. H., Cramond, B., and VanTassel-Baska, J. (2010). The Relationship between Creativity and Intelligence. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 395-412.

Küng, L. (2013). An Introduction: Innovation, Technology and Organizational Change, Legacy Media's Big Challenges. In: Storsul, T. and Krumsvik, A. H. (eds.), *Media Innovations: A Multidisciplinary Study of Change*. Gothenburg, Nordicom, pp. 9-12.

Küng, L. (2017). Strategic Management in the Media: Theory to Practice (2nd ed.). London, SAGE.

Kozbelt, A., Beghetto, R. A., and Runco, M. A. (2010). Theories of Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 20-47.

Kozbelt, A. (2019). Evolutionary Approaches to Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 109-131.

Lewens, T. (2018). Cultural Evolution. In: Edward N. Zalta (ed.), *The Stanford Encyclopedia of Philosophy. Available at: https://plato.stanford.edu/archives/sum2018/ entries/evolution-cultural/* – Accessed 16.12.2020

Long, H. (2014). An Empirical Review of Research Methodologies and Methods in Creativity Studies (2003–2012). *Creativity Research Journal*, Vol. 26, No. 4, pp. 427-438.

Lubart, T. (1999). Creativity Across Cultures. In: Robert J. Sternberg (ed.), *Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp.339-350.

Lubart, T. (2010). Cross-Cultural Perspectives on Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 265-278.

Mayer, R. E. (1999). Fifty years of creativity research. In: Robert J. Sternberg (ed.), *Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp.449-460.

Mell, J. C., Howard, S. M., and Miller, B. L. (2003). Art and the brain: The influence of frontotemporal dementia on an accomplished artist. *Neurology*, Vol. 60, No. 10, pp. 1707-1710. https://doi.org/10.1212/01.wnl.0000064164.02891.12

Miège, B. (2011). Theorizing the Cultural Industries: Persistent Specificities and Reconsiderations. In: Janet Wasko, Graham Murdock and Helena Sousa (eds.), *The Handbook of Political Economy of Communications*. Chichester, United Kingdom, Wiley-Blackwell Publishing Ltd, pp.83-108.

Müller, K., Rammer, C., and Trüby, J. (2008). The Role of Creative Industries in Industrial Innovation. *Journal of Innovation*, Vol. 11, No. 2, pp. 148-168. Available at: https://www.researchgate.net/publication/46457620_The_Role_of_Creative_Industries_in_Industrial_Innovation – Accessed 16.12.2020

Okoli, C. and Schabram, K. (2010). A Guide to Conducting a Systematic Literature Review of Information Systems Research. *Sprouts: Working Papers on Information Systems*, Vol. 10, No. 26. Available at: http://sprouts.aisnet.org/10-26 – Accessed 16.12.2020

Garnham, N. (2005). From Cultural to Creative Industries: An analysis of the implications of the "creative industries" approach to arts and media policy making in the United Kingdom. *International Journal of Cultural Policy*, Vol. 11, No. 1, pp. 15-29. https://doi.org/10.1080/10286630500067606

Runco, M. A. and Sakamoto, S. O. (1999). Experimental studies of creativity. In: Robert J. Sternberg (ed.), *Handbook of Creativity*. Cambridge, United Kingdom, Cambridge

University Press, pp. 62-92.

Runco, M. A. (2004). Creativity. *Annual Review of Psychology*, Vol. 55, No. 1, pp. 657-687.

Runco, M. A. (2010). Divergent Thinking, Creativity, and Ideation. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 413-446.

Runco, M. A. and Albert, R. S. (2010). Creativity Research: A Historical View. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*, pp. 3-19.

Russ, S. W. and Fiorelli, J. A. (2010). Developmental Approaches to Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 233-249.

Plucker, J. A. and Makel, M. C. (2010). Assessment of Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 48–73.

Rowley, J. and Slack, F. (2004). Conducting a literature review. *Management Research New, Vol. 27, No. 6, pp.31-39.*

Sawyer, R. K. (2006). Explaining Creativity: The Science of Human Innovation. New York, United States, Oxford University Press.

Schumpeter, J. A. (1942/2013). Capitalism, Socialism, and Democracy. Routledge. http://eet.pixel-online.org/files/etranslation/original/Schumpeter,%20Capitalism,%20 Socialism%20and%20Democracy.pdf – Accessed 16.12.2020

Simonton, D. K. (2008). Scientific Talent, Training, and Performance: Intellect, Personality, and Genetic Endowment. *Review of General Psychology*, Vol. *12, No.*1, pp. 28-46. doi:10.1037/1089-2680.12.1.28

Simonton, D. K. (2010). Creativity in highly eminent individuals. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 174-188.

Smith, G. J. and Carlsson, I. (2006). Creativity Under the Northern Lights. In: James C. Kaufman and Robert J. Sternberg (eds.), *The International Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 202-234.

Stanford, M. (2019). The Cultural Evolution of Human Nature. *Acta Biotheoretica*. doi:10.1007/s10441-019-09367-7

Sternberg, R. J. and Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity.* Free Press.

Sternberg, R. J. (2006). The Nature of Creativity. *Creativity Research Journal*, Vol. 18, No. 1, pp. 87-98. https://doi.org/10.1207/s15326934crj1801_10

Sternberg, R. J. and Kaufman, J. C. (2010). Constraints on Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 467-482.

Storsul, T. and Krumsvik, A. H. (2013). What is Media Innovation? In: Storsul, T. and Krumsvik, A. H. (eds.), *Media Innovations: A Multidisciplinary Study of Change*. Gothenburg, Nordicom, pp. 13-26.

Von Raffler-Engel, W. (1993). Enculturation Begins Before Birth. *Intercultural Communication Studies.* Vanderbilt University Institute for Public Policy Studies, p.21-32. Available from: https://www-s3-live.kent.edu/s3fs-root/s3fs-public/file/03-Walburga -von-Raffler-Engel.pdf – Accessed 16.12.2020

Vom Brocke, J., Simons, A., Riemer, K., Niehaves, B., Plattfaut, R., and Cleven, A. (2015). Standing on the Shoulders of Giants: Challenges and Recommendations of Literature Search in Information Systems Research. *Communications of the Association for Information Systems*, Vol. 37, No. 9, pp. 205-224.

Ward, T. B. and Kolomyts, Y. (2010). Cognition and Creativity. In: James C. Kaufman and Robert J. Sternberg (eds.), *The Cambridge Handbook of Creativity*. Cambridge, United Kingdom, Cambridge University Press, pp. 93-112.

Wasko, J., Murdock, G., and Sousa, H. (2011). Introduction: The Political Economy of Communication: Core Concerns and Issues. In: Janet Wasko, Graham Murdock and Helena Sousa (eds.), *The Handbook of Political Economy of Communications*. Chichester, United Kingdom, Wiley-Blackwell Publishing Ltd, pp. 1-10.

Wehner, L., Csikszentmihalyi, M., and Magyari-Beck, I. (1991). Current approaches used in studying creativity: An exploratory investigation. *Creativity Research Journal*, Vol. 4, No. 3, pp. 261-271.